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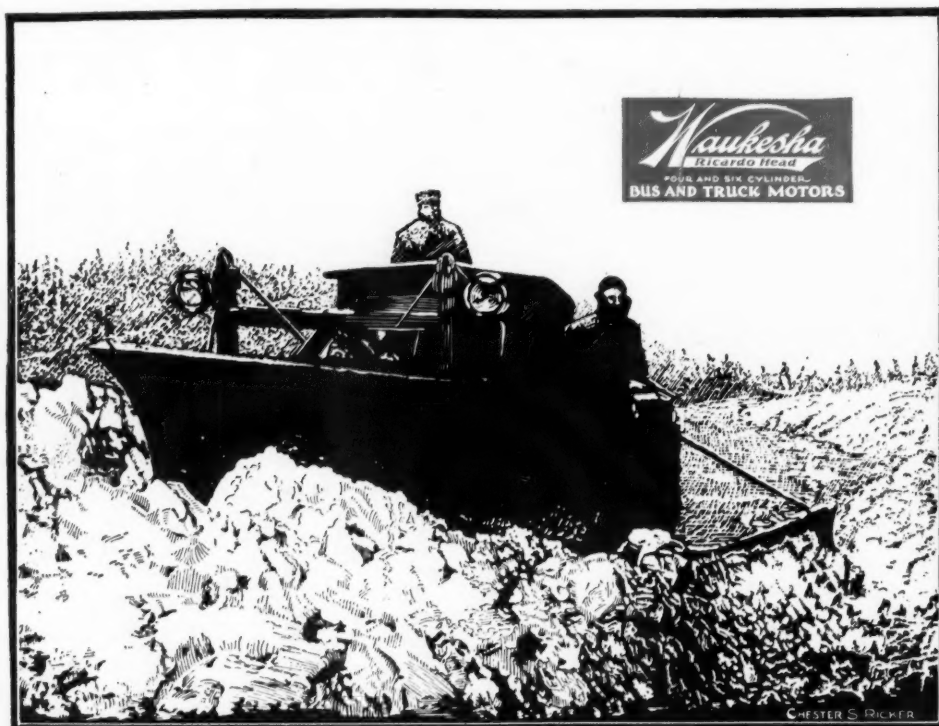


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No more severe motor conditions are encountered in crowding a power shovel than in bucking snow drifts, nor more responsiveness needed in maneuvering a boom than guiding one of these plows. Write for "Heavy Duty" Motor Bulletins describing Power Shovel Type motors with Waukesha "Ricardo Head."

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World Learning Automobile Utility, Transport Congress Shows

Used car growing problem in foreign markets. Retail finance plans developing abroad. Nearly 300 delegates from overseas. Next Congress may be in London.

By Norman G. Shidle

CONTINUED progress of the motor vehicle from the luxury to the necessity class throughout the world, the entrance of the used car as a real factor in merchandising in countries outside the United States, a continuance in highway development among foreign nations and definite advances in overseas merchandising and sales methods were among the chief topics of interest to American executives developed at the World Motor Transport Congress held in New York at the Roosevelt Hotel, January 11 to 13, under the auspices of the National Automobile Chamber of Commerce.

A large part of the meeting, the second of its kind to be held, was devoted, naturally, to giving the foreign delegates information about those merchandising and service methods which have made possible the unprecedented success of the American industry. These aspects of American development were presented by the leading executives of the domestic industry.

The purpose and achievement of the gathering were well expressed by Col. Charles Clifton, president of the N. A. C. C., who said:

"We find ourselves here today sitting in council trying to determine what we can do as a unit in the promotion of motor transport. This is an unparalleled demonstration of commercial effort divorced from self-seeking.

"The motor vehicle is used by the farmer of Sweden, by the school superintendent in Australia, by the ranchman in Argentina, each in his daily tasks. This is the thought that we must emphasize if the motor vehicle is to be ultimately considered on its rightful economic merits by everyone and not continually made an easy goose from which to pluck golden eggs with the result that the poor creature in some countries is well-nigh defunct.

"As we cooperatively obtain this recognition of the production which we all are selling and more moderate taxation results, the field for motor transport is certain to spread with great rapidity."

At the opening session of the Congress Sir William Letts, president of the British Society of Motor Manufacturers and Traders and president of the Willys-Over-

land Co. of Stockport, England, proposed that the Third World Motor Transport Congress be held in London in conjunction with the Olympia Show. John N. Willys, chairman of the foreign trade committee of the National Automobile Chamber of Commerce, who presided at this first session, replied that the proposition would be considered carefully and that action would be taken shortly. It is considered altogether probable that the American manufacturers will view the suggestion with favor and will consent to send delegates to such a conference when it is held.

World-Wide Progress Recorded

Progress in motor vehicle use and development throughout the world was recorded by practically all of the speakers from foreign lands. Nearly 200 delegates, representing some 50 different countries, were in attendance and many of them contributed ideas of interest to American manufacturers seeking overseas markets and also took away information which will be useful to them in carrying forward future automotive development in their home lands. Canada had the largest delegation at the Congress, followed by Germany, Great Britain and France in the order named.

That the used car is becoming a definite factor in selling in foreign markets was indicated specifically in the statement made by William Campbell of Johannesburg, South Africa, that, in his country, a trade-in is involved in 80 per cent of the new car sales. "As everywhere else," Mr. Campbell said, "the bugbear of the trade is the used car problem and it is becoming more acute. In the past in the disposing of these, there was too much of the 'horse cooping' methods, but largely that has found its own end. Today while we have not a few plungers who are making their own difficulties by the prices they allow, the reliable and trustworthy dealer has learned to protect himself and, so far, is finding an outlet, but, at the same time, is losing sales to his more venturesome competitor."

More used car difficulties are involved in high price car selling than in the low priced group, according to Mr. Campbell. "We have but a few dealers who confine themselves to handling used cars," he stated, "and these claim to be



Some of the delegates to the World Motor Transport Congress. In the group on the left are the members of the Far East delegation. STANDING, LEFT TO RIGHT: K. Osawa, J. W. Hausserman, Arthur C. Turner. SEATED: N. Lyons. The delegates from South Africa are seen in the group on the right. STANDING: William Campbell. SEATED: A. Macauley (left) and Arthur Gaydon

able to dispose of the cheaper cars in good mechanical condition without difficulty, but the real difficulty lies with cars of the higher value."

The question of car prices in foreign markets came up several times, both in the speeches and in informal discussion around the meeting. American manufacturers who have been striving to have their products put into the hands of the foreign buyer at the lowest possible cost found some support for their efforts among the foreign delegates, but it was apparent that the possibilities of profit through quantity sales rather than through high prices on individual cars still is far from being universally recognized. That work along this line will be continued by American exporters seems certain.

That the motor vehicle gradually is being recognized as a utility rather than a luxury was indicated by statements made by a number of the foreign representatives. H. Jenny of H. Jenny & Co., Switzerland, for example, reported the development in his country as follows:

"We are slowly beginning to realize that the motor vehicle is far from a luxury and is just as important a factor in our everyday life as any other means of transportation. This idea of luxury still persists," he added nevertheless, and pointed out that "the taxes which are allocated to the owners of automobiles are heavy enough to discourage the most eager prospect for the ownership of a car."

The taxation situation, while not as bad in many overseas areas as in the case cited, is sufficiently difficult in



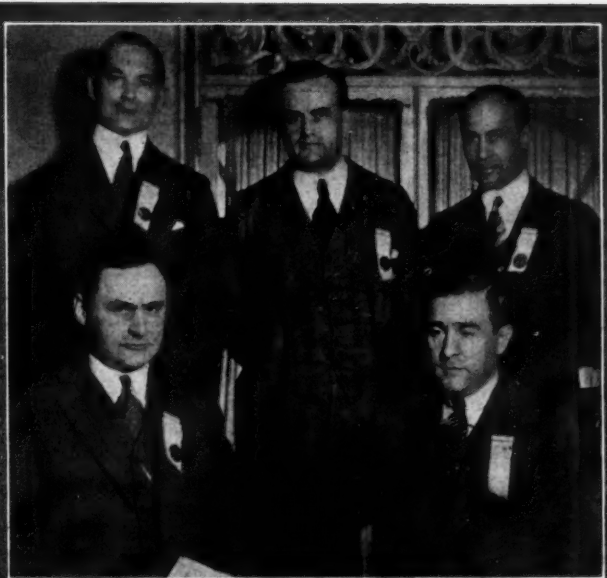
STANDING, LEFT TO RIGHT: Frank Mark, Czechoslovakia; Arnost Mohelsky, Czechoslovakia; Walter Zipper, Austria; C. P. Flamand, Belgium; C. Schlotterbeck, Jr., Switzerland. SEATED: Emil Zipper, Austria; Chas. Schlotterbeck, Sr., Switzerland; Henri Jenny, Switzerland; Jacques Tschud, Switzerland



STANDING: J. E. Kastengran, Finland; Dr. Alfred Vischer, Germany; Otto Kleyer, Germany; Dr. H. Frohwein, Germany. SEATED: P. H. Schweitzer, Hungary; B. Blanchere, France; Dr. Otto Wawrzynior, Germany; Paul Cappel, Germany



BRITISH DELEGATION. STANDING: C. E. Wallis, G. A. Woodhead, W. R. Shepard. SEATED: Major T. P. Seairight, H. G. Burford, Frank Lanchester, Rowland Winn



ARGENTINIAN DELEGATION. STANDING: M. Moreno, E. S. Morgan, H. E. Braisted. SEATED: E. Posselt, Herberto Szamatolski

many areas to make it a definite factor in sales resistance. As the utility value of the motor vehicle becomes more apparent, however, it is expected that conditions in this respect will gradually improve.

While most of the discussions presented by American executives were directed entirely to outlining our domestic methods to the foreign visitors, several of the speakers presented suggestions which had a definite application to a domestic as well as to foreign problems.

Talking of the place of publicity in the motor car business, for instance, Walter P. Chrysler, president, Chrysler Corp., in a paper read in his absence, made the pertinent statement that "when the factory has sent this material to the press it has gone as far as it should go in the direction of publicity. By that I mean," he continued, "that in the last analysis it is the duty of the editor of the newspaper or magazine to decide whether the article submitted to him is of interest to his readers."

Mr. Chrysler defined publicity as "the dissemination and publication of facts about a business which are of public interest."

"Vocational selling is a natural development of the demand for more intensive merchandising. It is a means of sending a salesman's energy where it will produce the greatest results at the lowest possible cost," Martin L. Pulcher, president, Federal Motor Truck Co. told the Congress in his talk on "Vocational Selling as a Business Aid." While Mr. Pulcher's talk was, of course, directed primarily to the foreign delegates, much of what he said has a very direct bearing on domestic truck selling at the present time.

Every truck salesman, Mr. Pulcher believes, should specialize on a few industries or trades so that he can understand thoroughly and talk intelligently about the transportation needs and problems of those particular lines of business. Only by becoming a competent transportation advisor can the salesman do his job successfully, according to Mr. Pulcher. And he can't be a competent advisor unless he specializes on two or three specific fields.

The dealer and the salesman can't be expected to provide all of the detailed information needed about specialized fields. There must be someone at the factory, Mr. Pulcher says, "whose job is to supply the selling force with the necessary data and statistics on the various industries and

to enable the salesman intelligently to complete his education on the particular group he is handling."

The chief danger of vocational selling, Mr. Pulcher pointed out, is that the salesman will spend so much time gathering information and working out pet plans for tabulating it that his productive selling effort will be cut down to a prohibitive degree. This difficulty should be recognized, and overcome by keeping the vocational selling plans as simple as possible.

Truck exhibits at various business shows held by specific industries were recommended by Mr. Pulcher as excellent sales propaganda. "Analysis of our sales record," he said, "shows that in one particular industry at whose show we have been represented for a number of years, we have more trucks operating than in any other outside of general hauling."

Other representatives of the American automotive industry who spoke to the Congress together with their topics are as follows:

Charles D. Hastings, president, Hupp Motor Car Co., "Efficient Sales Administration"; H. H. Bassett, president, Buick Motor Co., "Developing Capable Salesmanship"; Charles Warren, president, Warren-Nash Motor Corp., "Effective Retail Merchandising"; R. C. Graham, vice-president Graham Brothers; R. A. Stranahan, president, Champion Spark Plug Co., "Ask Them to Buy"; Roy D. Chapin, vice-president, National Automobile Chamber of Commerce; E. V. Rickenbacker, vice-president, Rickenbacker Motor Company; Alvan Macauley, president, Packard Motor Car Co., "Organizing for Service"; S. D. Black, president, Black & Decker, "The Shop of Efficient Service."

Other activities included visits to the National Automobile Show, inspection of traffic control methods, study of commercial motor transport, discussion of highway development abroad, solving questions of automotive finance and other problems confronting overseas dealers, attendance at banquets of N. A. C. C., M. & A. M. A. and S. A. E. and visits by delegates to automotive factories located in the various parts of the United States.

To George Bener, foreign trade secretary of the N. A. C. C. goes much of the credit for this successful organization and operation of the Congress.

Original *Dollar* in Hupmobile Grows to \$2,000

Financial history of Hupp Motor Car Corp. shows steady growth.

Stock reached new high level in 1925 although earnings per share were not as great as in year 1922.

By A. Motelle

THE changed attitude of the investing public toward motor securities cannot be better illustrated than by citing the case of Hupmobile. In 1922, with earnings of \$7.14 per share, the stock of the Hupp Motor Car Corporation attained a peak of \$26.10. The company did not show as great an earning power per share in 1925 as in 1922, yet its stock was quoted on the exchange not long ago at \$31, which is the highest it ever had been.

The company in 1925 showed a remarkable improvement in earnings over 1924 and this accounts for the rise of the stock during the year from a low of \$14.50 to the high of \$31 referred to above. The willingness of the investing public to pay nearly \$5 more in 1925 for earnings which were scarcely more than 60 per cent of the earnings per share in 1922 is due to the change in attitude toward motor securities in general.

Growth Has Been Substantial

Looking over the history of the present company one is impressed with its substantial growth. The net working capital, standing at \$8,100,000 (exclusive of \$1,250,000 of notes receivable), is at present over 5 times what it was in 1917 when it stood at \$1,571,000, and property less depreciation increased in about the same rate, viz., from \$1,482,000 to \$7,537,000.

The present company, incorporated November 24, 1915, is a successor of the original Hupp Motor Car Com-

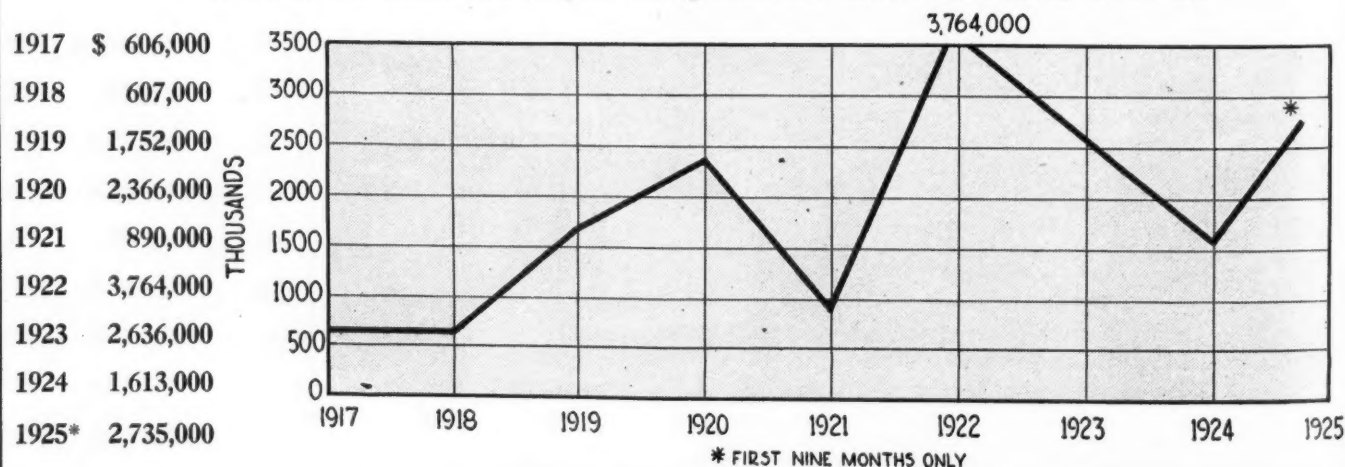
pany founded eleven years earlier, the original capitalization having been \$11,000. The company also acquired certain subsidiary interests. The original investor in the old company has seen his \$1 invested grow to nearly \$2000.

This building up of the business was achieved chiefly through accumulation of earnings. While a stock dividend of 10 per cent was paid in March, 1923, the only time since 1917 when stock was sold by the present company was in 1924 when 342,768 shares were offered to shareholders at \$12.50 per share. This brought in some \$4,280,000 new money. During the same period \$1,308,000 of preferred stock was retired (\$100 par value). Over \$9,600,000 was thus plowed back into the property out of earnings, the financial position was nicely rounded up and the earning power correspondingly increased.

The result of this, from a market point of view, is that, while in earlier years the earning power of the company was rarely appraised by the market at more than 7 times, it has recently been valued at 9-10 times.

The lack of uniformity of bookkeeping practice as regards volume sold and profits thereon makes it difficult to obtain a homogenous series of profits per car. The data available, however, indicates that the margin of profit per car has tended sharply downward. In 1924, net after depreciation, but before deduction of taxes and interest, amounted to \$58.50 per car while in 1922 it was \$131.

Net Income Available for Hupmobile Stockholders, 1917-25



Market Value of Hupmobile Securities for Nine Years, 1917-25

1917 — \$ 4,164,000

1918 — 3,416,000

1919 — 8,877,000

1920 — 12,936,000

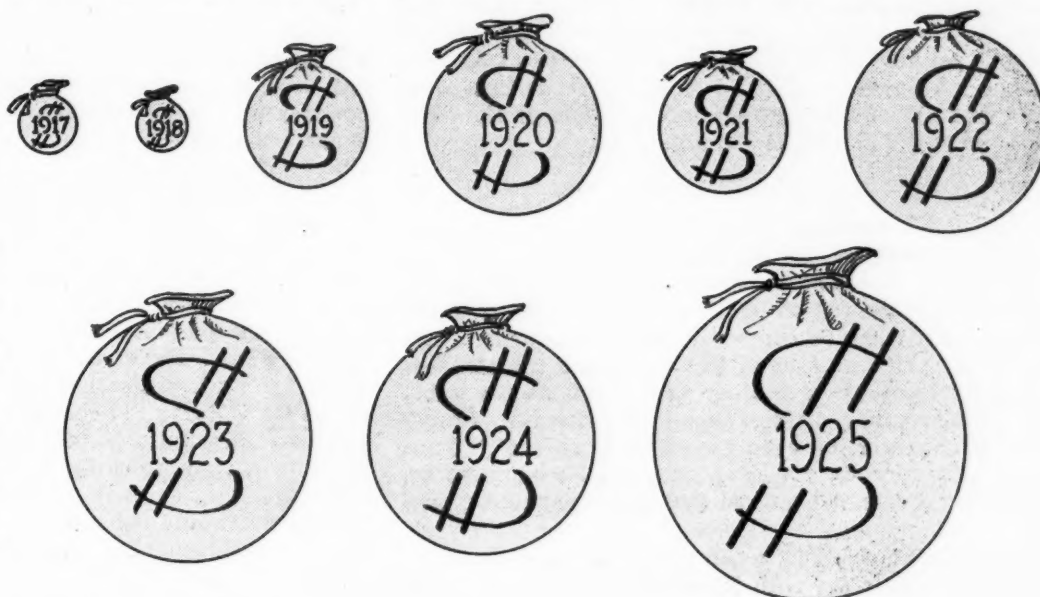
1921 — 9,501,000

1922 — 14,245,000

1923 — 17,419,000

1924 — 16,449,000

1925 — 22,950,000



Earlier, in 1919 and 1921, the average profit per car (applying the income from all sources) was around \$170 while in the first years of the company's history, as in 1916 and 1917, the net profit per car after all deductions averaged a little over \$35 per car.

The figures cited earlier, relating to the profits per car after depreciation, were not the final net profits per car available to the stockholders. After interest, taxes and all other deductions a net profit of \$52 per car was shown in 1924; \$68.50 in 1923; \$110 in 1922 and \$65.50 in 1921.

This company, like many others, was able to pass on to the consumer a considerable part of the profits resulting from higher operating efficiency consequent upon larger production. Thus, while up to 1921 the total number of cars sold annually fluctuated between 9,544 (year ended June, 1919) to 19,225 (year ended June, 1920), and while in 1921 it was only 13,614, since 1922 the number sold has never fallen below 31,004.

The average profit per car sold in the period 1922-1924 was \$77 against \$97 for the three preceding years.

Averages Wholesale Prices

The average wholesale price of a car sold (applying to the value of sales all other manufacturing income) was around \$1,040 in 1924, slightly under \$1,000 in 1923, and fluctuated around the \$1,000 mark in all the remaining years since 1916, except 1920 and 1921 when it was materially in excess of \$1,000—as high as \$1,450 in 1921.

During those years only one type of car was produced and that was a medium-priced four-cylinder model. The average price received per car this year will be higher than the average of previous years—with the possible exception of 1920 and 1921—due to the fact that a large part of the production has consisted of a more expensive eight-cylinder model. The figures of gross sales and production for the first nine months of 1925 bear out this contention. For that period the average price received per car was \$1,231.

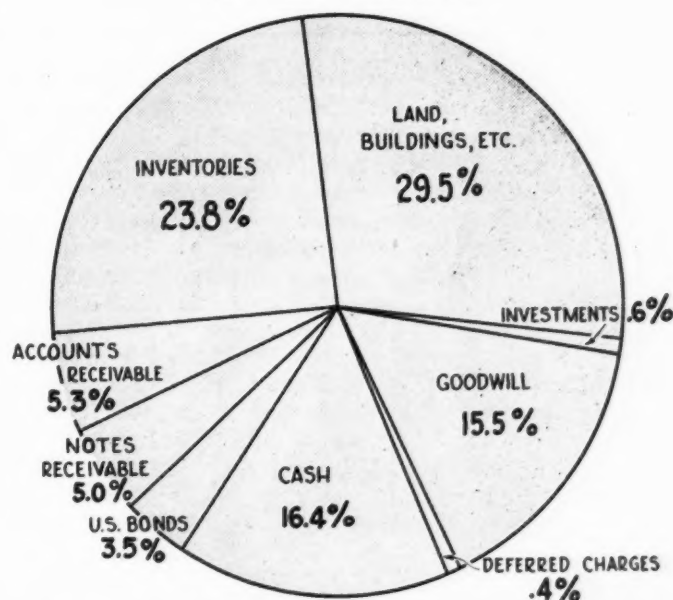
Since the introduction of another new model—a "six"—several months ago, the company has ceased production of the "four" entirely, although as between the old "four" and the new "six" there is very little price

difference and it is highly probable that the average price per car will be around \$1,200 for the whole of 1925.

In recent years the total net income after all normal deductions tended to be under 10 cents on the dollar of gross sales; last year it was slightly under 5 cents, the year before under 7 cents, but in 1922 it was as high as 10.8 cents. In the first 9 months of 1925 the net profit amounted to 7.4 cents, exclusive of 1.2 cents profit from sale of plant assets.

The company's earnings per share before taxes on its tangible assets amounted to 12.2 per cent in 1924, 20.7 per cent in 1923 and in excess of 40 per cent in 1922. These profits were inclusive of the non-operating income,

How Hupmobile Gross Book Assets are Distributed



The above chart shows the distribution of the gross book assets of the Hupp Motor Car Corp., as of September, 1925. The value of the assets totaled \$25,106,000

but before all deductions, except depreciation, when reported. They are calculated on the net working capital and depreciated plant, leaving out all intangible and other minor balance sheet items. Similarly calculated in the first 9 months of last year, the company earned nearly 30 per cent on its net tangible assets, or at the rate of 40 per cent per annum. The company, it is thus seen, has a profitable business and 1925 was one of the best, if not the best, year in its history.

Earnings for 1925

In the first 9 months of last year the company earned \$2.58 per share and the earnings for the full year are likely to be in excess of \$3 per share should the company have earned in the fourth quarter only as much as in the third quarter, when 65 cents per share was earned. At the current price of around \$26 per share the stock is apparently discounting another year about as profitable as the present and a maintenance of the company's present earning power, or even an increase thereof. It is perhaps also discounting some additional disbursement, the present dividend being \$1 per share payable quarterly.

As of September, 1925, total book assets amounted to \$25,106,000, comparing with \$22,428,000 at the same date last year. These gross book assets were distributed as follows (figures in parenthesis give the corresponding data for last year): Land, buildings, etc., absorbed 29.5 per cent (37.5 per cent); of the total book assets investments .6 per cent (.7 per cent); goodwill 15.5 per cent (17.4 per cent); deferred charges .4 per cent (1.2 per cent); cash 16.4 per cent (11.1 per cent); U. S. Bonds 3.5 per cent (4.4 per cent); notes receivable 5.0 (none); accounts receivable 5.3 per cent (6.7 per cent); inventories 23.8 per cent (21.8 per cent); total current assets 54.0 per cent (44.0 per cent). There is thus noticeable an expansion in inventories, as well as of total receivables, but a compensating feature is the strengthening of the cash position. A relatively liquid position is indicated.

On the liability side, total current liabilities were 16.4 per cent (16.5) of total book liabilities in which accounts payable were 8.9 per cent (10.1 per cent), the rest consisting of reserves for taxes and dealers' deposits. The remaining liabilities consists of the 913,809, \$10 par value

shares which absorbed 26.5 per cent (40.0 per cent) of the gross book liabilities and of corporate surplus 47.1 per cent (43.5 per cent). The gross book value of the stock thus works out at about \$23 per share.

If the notes receivable, which may be in the nature of a long term loan, are excluded from current assets the net working capital works out at some \$8.90 per share common and depreciated plant at an additional \$8.30 per share. Goodwill amounted to about \$4.25 per share. The total, including minor items, brings the gross book value of one share to \$23. On an equity basis the stock is selling considerably cheaper than many motor shares and there would be no question of the attractiveness of the stock should the present earning power of the company be maintained over a number of years.

As to the possibility of increase in the dividend, the company has a larger working capital than it apparently needs for its business and the largest cash and equivalent in its history. Probably the company could without difficulty distribute \$1,000,000 of cash without placing itself in a tight working capital position. This would mean that the company could increase its dividend to \$2 and then it would not have paid out more than 2/3 of its current earnings. But there is no certainty that such a course will be followed.

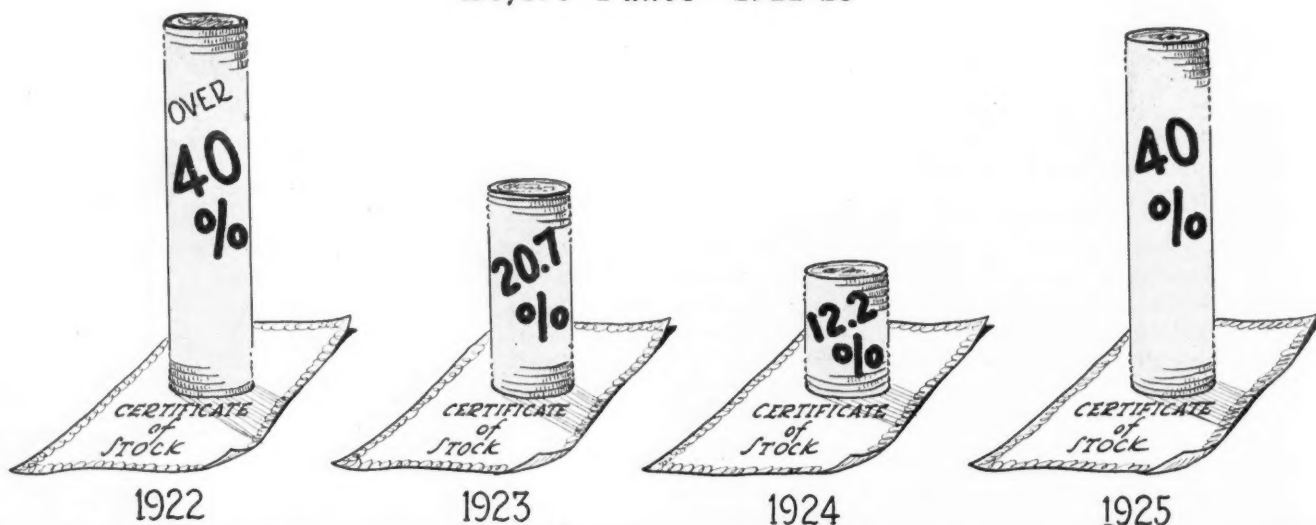
The reader will probably be interested in an analysis of the income account of the company.

1924 Gross Sales

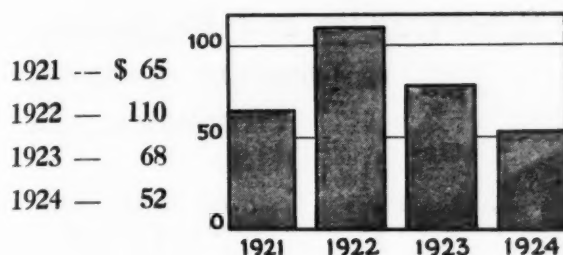
In 1924 gross sales were \$32,320,706 when 31,004 cars were sold. (Following figures in parenthesis represent corresponding data for 9 months of 1925). The operating expense in 1924 was 94.9 cents (85.1) per \$1 of sales and the operating profit 6.1 cents (14.9). Outside income amounted to 1.35 cents (not reported for 1925), making the total income per dollar of sales 7.45 cents. Of this amount 2.04 cents was charged to interest and depreciation and 1.6 cents was charged off as development expense incurred in bringing out the Hupmobile Straight Eight (the total amount charged off having been \$518,439) and .51 cents for Federal taxes. This left 3.4 cents as the net profit for 1924 on the dollar of gross sales.

The net profit as reported for 1925 is 8.6 cents on the dollar; this includes 1.2 cents of non-operating and non-recurring income, viz., profit on sale of plant assets.

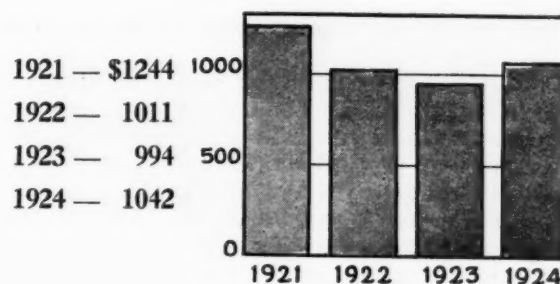
Hupmobile Earnings Per Share on Tangible Assets Before Taxes—1922-25



Hupmobile Net Profit Per Car 1921-24



Net Value of Sales Per Car 1921-24



Of the 3.4 cents earned after all deductions on each dollar of gross sales last year, 2.12 cents was paid out to stockholders and 1.28 cents placed in surplus account. As already mentioned, in the first 9 months of 1925 the company earned \$2.58 per share or \$3 if the profit on

sales of plant assets are included, while in 1924 during the same period it earned \$1.28 cents and for the whole year \$1.85 cents if we include the charge off of 57 cents per share on account of development expenses incurred on the Straight Eight.

Market Value of Automobile Securities Increased Billion Dollars in 1925

A REVIEW of 1925 stock market activities reveals some surprising developments in the automotive field. No other branch of American industry fared so well as the motors in appreciated stock values. At the beginning of 1926 the market value of the American automotive industry (based on its securities) exceeded by approximately a billion dollars the market value at the start of 1925.

An analysis of the year's gains and losses in market value of the 772 stocks regularly listed on the New York Exchange shows that the total net gain was \$4,907,270,138. Of this total gain, \$810,246,452, or 16.5 per cent, is credited to 28 securities of motor vehicle and engine manufacturers. If the gains also made by listed stocks which come under the general head of automotive, such as tires, bodies, parts and accessories, etc., were added to this, the total would be pushed well above the billion mark. For the purpose of establishing the relative position of motor stocks, however, only the 28 securities mentioned above were used.

It will be seen that, while these 28 automotive securities accounted for 16.5 per cent of the total gain made by all stocks listed on the Exchange, they represented only 3.63 per cent of the total number of securities so listed.

An automobile manufacturing company stood at the top of the list in the amount by which the open market value of its securities had increased during the year. This was General Motors Corp. There are four classes of General Motors securities listed and together they showed a gain of \$281,064,802, distributed as follows: General Motors common, \$267,112,800; General Motors pf. (6), \$150,267; General Motors pf. (7), \$13,566,903; General Motors deb., \$234,832. Other outstanding increases were: Hudson Motors, \$100,917,540; Chrysler, \$82,371,708; Nash, \$72,549,750, and Packard, \$67,982,772.

The 20 remaining securities of the 28 included in this analysis increased in value as follows:

Studebaker	\$21,328,125
Mack Trucks, Inc.	30,218,983
Willys-Overland com.	43,862,949
Willys-Overland pf.	10,363,265
Advance Rumely	395,302
Advance Rumely pf.	812,500
Chandler	3,460,000
Dodge Brothers, Inc., Class A	40,383,559
Dodge Brothers, Inc.	11,475,000
Gardner Motor	794,375
Hupp Motor	8,566,875
Mack Trucks 1st. pf.	382,263
Mack Trucks 2nd pf.	306,572
Moon Motors	2,160,000
Paige-Detroit	5,814,185
Pierce-Arrow	6,944,843
Pierce-Arrow pf.	4,350,000
White Motors	5,750,000
Continental Motors	6,349,042

As this list includes manufacturers of passenger cars, trucks, buses, tractors and engines, it may be said to be fairly representative of the industry as a whole and the stock value increases given are indicative of the prosperity which was common to all automotive manufacturers in 1925.

The 28 securities under consideration made an average gain in points during the year of 30 2/7. The largest gain in this respect for any individual security was made by Nash, 265 3/4 points. For the greater part of the year Nash stock stood higher than any other listed on the Exchange, ranging around 450, to which point it had climbed from a low of 193 1/2 earlier in 1925. With the declaration of the 900 per cent stock dividend last week it went to a new high level of 517.

General Motors common in 1925 registered a net gain in points of 51 3/4 and the net gain of Hudson was 75 7/8 points.

Indicating and Recording Pyrometers

This is the second of a series of articles on the various phases of the problem of measuring and controlling temperatures in automotive production. It deals with the design and construction of pyrometers, both indicating and recording, and is a logical continuation of the first article, which discussed thermo-couples and appeared in *Automotive Industries*, December 4, 1925.

By P. M. Heldt

AN electric galvanometer or milli-voltmeter for use in thermo-couple circuits must be of a high degree of sensitivity, owing to the very low electromotive forces produced by the thermo-couple. For instance, with a platinum thermo-couple at 1650 deg. F., the electromotive force is only 8.4 milli-volts and this must produce more than half the full scale deflection.

The instruments used for measuring the voltage are always of the movable coil type, in which a current produced by the electromotive force to be measured, and proportional thereto, flows through a movable coil and creates a magnetic field which is at an angle to another magnetic field created by a permanent magnet. The reaction between the two magnetic fields tends to swing the coil around so as to make its field coincide with that due to the permanent magnet, and this movement is opposed by a spring, usually of the spiral type.

The magnetic field due to the permanent magnet is constant and that due to the coil is of a strength directly proportional to the current. The turning moment on the coil is proportional to the product of the two field strengths, and since the torsion of the spring is directly proportional to its deflection, the coil will be turned through an angle directly proportional to the current flow. The result of this is that the scale divisions are practically uniform from

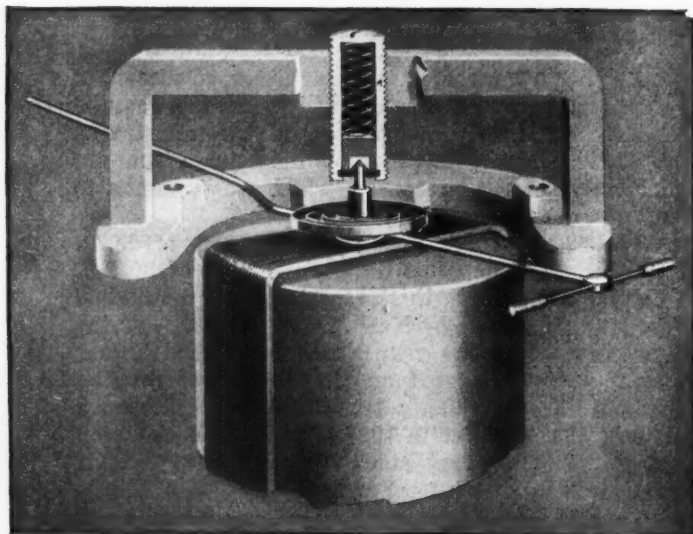


FIG. 1—Illustrating method of supporting armature on jeweled bearings between coiled springs in Hoskins pyrometer galvanometer.

Sensitiveness and Ruggedness are to measure electromotive couples. Details

end to end, the variations being due to the fact that the electromotive force of the thermo-couple does not vary in direct proportion to the temperature.

In order to secure the required degree of sensitivity and at the same time make the instruments more or less immune to the shocks of rough usage, the support of the movable system must be very carefully worked out. Usually the armature is provided with a hardened steel staff or spindle, the ends of which are ground to very fine points and are set in jewels. Even though the movable system or armature is made as light as possible, there is danger of dulling the fine points and thus greatly to increase the resistance to motion, if they have to sustain shocks, and to prevent this the jewels are usually cushioned. The way this is done in the Hoskins pyrometer-galvanometer is shown in Fig. 1. Only the top pivot is shown, but the support at the bottom is similar. It will also be noticed that the indicating hand is counterbalanced, which is another feature common to pyrometer indicating instruments.

Features of Indicating Instruments

Some manufacturers, like Engelhard, support the moving system by metallic filaments or fine wires at top and bottom. These fine wires serve a triple function. They support the movable system, carry the current to and from the armature and act as torsion springs to counteract and measure the magnetic movement. This is the same type of suspension as used for laboratory galvanometers. The filaments are supported by flat springs at top and bottom, which absorb shocks.

In the past there seems to have been considerable discussion as to the relative merits of low resistance and high resistance instruments. Since for a given thermo-couple and temperature range the electromotive forces to be measured are the same, the lower the resistance of the instrument the greater the current that flows through it, and the greater the magnetic moment that actuates the movable system. Hence, a low resistance instrument need not be built with such a delicately supported moving system.

One factor that determines the sensibility of the instrument is the resistance to motion at the pivots or supports of the movable system. If the pivots are made so as to present a substantial support that cannot be injured easily by shocks and rough handling, then the resistance to motion will be quite high and a greater magnetic moment will be required, which the low resistance instrument provides.

Ordinarily a milli-voltmeter is calibrated to indicate the voltage applied to its terminals. What has to be determined in the case of an electric pyrometer is the voltage generated at the hot junction, and when a current is flowing in the circuit this is not the same as the voltage at the instrument terminals, because a loss in voltage is sustained in overcoming the electrical resistance of the elements and of the lead wires.

If the instrument were designed to be used only with a single thermo-couple, it could be calibrated to take account of the resistance of this couple and its leads; however, a single indicating instrument usually is used for a

Then the whole of the electromotive force of the cell is required to force the current through this resistance, and to force it through any portion of it, say one-tenth, an equal fraction of the total electromotive force is required. Thus by connecting across different sections of the circuit we can obtain an electromotive force representing any desired fraction of the total electromotive force of the cell.

The Potentiometer Principle

Of course, if this section of the original circuit were merely shunted by another conductor, then the current would be divided between the two alternate paths and the electromotive force active between the junction points would be reduced, because the shunt would reduce the resistance between these points. But if the shunt contains a source of electromotive force exactly equal to the voltage drop in the section of the main circuit, then no current will flow in it, and it will not disturb the voltage between the junction points.

This method of measurement is used in the Leeds-Northrup pyrometer, and the way in which it is applied is illustrated in Fig. 2. A current from the dry cell BA is constantly flowing through the potentiometer circuit A-B-C-D-E-F. The section D-G-E of this circuit is a slide wire of uniform resistance over its whole length. The temperature scale is fixed to this slide wire. The current from cell BA as it flows through D-G-E sets up a difference in potential between D and E. There will also be a difference in potential between D and all other points of the slide wire. The polarity of this is in opposition to the polarity of the electromotive force of the thermo-couple which connects into the potentiometer at D and G. By moving G along the slide a point is found where the potential between D and G in the slide wire is just equal to the electromotive force generated by the thermo-couple. A galvanometer in the thermo-couple circuit indicates when the balance is reached, the galvanometer needle then indicating no deflection.

The potential in the slide wire will vary with the current from the cell BA, and a means for standardizing this is provided, in the form of a Weston type cell SC. This has a constant electromotive force and is connected to the potentiometer circuit at points D and F by closing the contact between SC and Galv. whenever the potentiometer current is to be standardized. The galvanometer is then in series with SC. The rheostat R is then adjusted until the current flowing is such that, as it flows through the slide wire D-G-E and the standard resistance EF, the

fall in potential between D and F is just equal to the voltage of the standard cell SC. The galvanometer then shows no current. The standard cell is then disconnected and the thermo-couple connected by closing the contact shown between Galv. and the positive side of H.

Having explained the principle of the potentiometer, we are now in position to explain the method of making correction for variations in the temperature of the cold junction with this system. As previously explained, the balancing potential is active between points D and G and is varied by moving point G. As the temperature of the cold junction rises, the net electromotive force generated by the thermo-couple decreases, assuming the hot junction temperature to remain constant. To balance this decreased electromotive force, point D is made movable and the slider D is moved along the scale to a point corresponding to the known temperature of the cold junction, and then the potentiometer is balanced by moving the slider G. The reading of G will then give the temperature of the hot junction directly. The same result can be obtained by shunting a resistance or slide wire between D and E and moving the galvanometer connection along this wire. This is the method of making corrections for changes in cold junction temperature by hand. To aid in making compensation, a temperature scale is fixed alongside of the compensating slide wire.

Automatic Cold Junction Compensation

The method of making automatic compensation for variations in cold junction temperature in the Leeds & Northrup pyrometer is illustrated in Fig. 3. Here N and M are the compensating resistances and point D is mechanically fixed. Resistance M is constant, that is, unaffected by temperature changes, while N is made of nickel, which has a high temperature coefficient, its resistance increasing 0.25 per cent for every degree F. rise in temperature. This latter resistance is placed close to the cold junction, so that its temperature varies as that of the latter, and this has practically the same effect on the balancing potential between D and G as the movement of point D in the hand-operated compensator.

From the above it will be understood that with the Leeds & Northrup pyrometer, if the temperature at the location of the thermo-couple varies from that for which the instrument has been set, the potentiometer will be unbalanced and the instrument pointer will deflect from the zero position. The question then arises how this deflection is utilized to record the temperature on the chart of the recorder.

For this purpose an ingenious self-balancing mechanism is made use of. To balance the potentiometer after its balance has been disturbed by a change in the voltage of the thermo-couple, the movable contact must be moved along the slide wire, and this motion is effected automatically, as are also the auxiliary operations of periodically connecting the standard cell and adjusting the resistance in circuit to compensate for changes in the electromotive force or the internal resistance of the dry cell operating the potentiometer.

A ball-bearing electric motor is used to drive the recording mechanism, and is mounted with its axis vertical. Underneath it, in the box seen in Fig. 4, is located a governor which keeps the speed of the motor constant and thus enables the latter to perform the function of a clock. The mechanism for automatically balancing the potentiometer circuit is shown in diagram in Fig. 6.

The shaft A is driven from the motor shaft through reduction gearing at a speed of about 30 r.p.m. This shaft carries two large spiral cams B₁ and B₂, adapted to coact with a balance lever C. As that portion of the cams

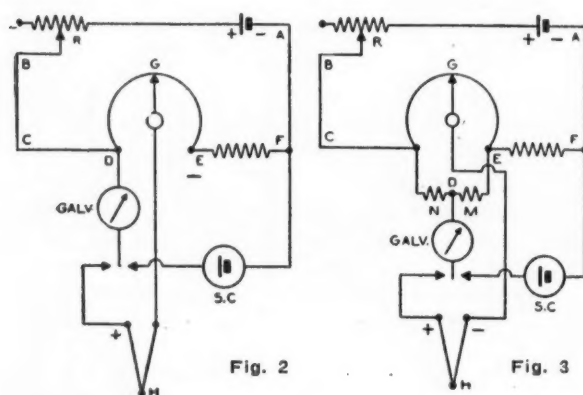


FIG. 2—Electric circuits of Leeds-Northrup potentiometer pyrometer.

FIG. 3—Method of automatically compensating for changes in cold junction temperature with Leeds-Northrup potentiometer pyrometer.

B_1 and B_2 which has the largest radius, approaches the lever C, the latter is moved into a horizontal position. A moment later when the "high point" of the cams has passed the lever, the latter is free to assume an inclined position. When the lever C is being returned away from its horizontal position it is being pressed against the disk D by the flat spring E, on which it is pivoted, and it therefore takes along the disk in its motion.

In addition to the two large cams B and B, the shaft A also carries two small cams F and G. As soon as the high point of cams B has passed lever C, Cam F engages with spring E, moving it in the direction away from the disk and freeing the lever C from the disk. Thus, when lever C assumes an inclined position it does not carry the disk along with it.

After lever C has been released from the disk, the other small cam on shaft A (cam G) comes into action and raises the yoked lever H, which is pivoted to the frame of the instrument. In the illustration, I represents the movable coil of the instrument, which is suspended by the filament J. The pointer of the instrument, which is secured to the moving coil, extends over the yoked lever H, and directly above the pointer are located the horizontal arms of two bell cranks K_1 and K_2 , which are pivoted at k_1 and k_2 . The horizontal arms of the bell cranks extend toward each other, and if the pointer of the instrument is in the zero position, it is directly underneath the space between the ends of these arms. Then, when the yoked lever H is raised by cam G and raises the pointer, the latter passes through the space between the ends of the horizontal arms, and no effect is produced on the arms. In this case, since the pointer is in the zero position, the potentiometer is already balanced.

But suppose that, owing to a change in the temperature of the furnace, and a consequent change in the voltage of the thermo-couple, the circuit has become unbalanced and the pointer is deflected to one side of the zero mark. Then, as it is raised by the yoked lever H, it engages under the horizontal arm of one of the bell cranks K and moves that bell crank around its pivot. The downwardly extending arm of that bell crank presses against a projecting pin on the lever L, which latter is rigidly connected with lever C. Thus, whenever the circuit is unbalanced, the lever C will be automatically swung into an inclined position, by power derived from the motor, and in being returned to the horizontal position, also by the power of the motor, it will move the disk D around in a certain direction, and with it the slide wire, which is wound on the circumference of the disk. During a single cycle, completed in two seconds, the disk is moved around through an angle which varies somewhat with the deflection of the instrument pointer, and if this is not sufficient to restore the balance, it is moved farther during the next cycle.

The bell crank mechanism is double, and the disk is moved in one direction or the other according to whether the potentiometer is unbalanced one way or the other.

Checking Against Standard Cell

In recording the temperature on a chart, use is made of a pen or a recording wheel which is capable of moving transversely across the chart on a rod supported by the instrument frame, as may be clearly seen in the rear view, Fig. 5. The pen holder or slide is connected to a cord which passes over rollers near both ends of the rod, and then passes on to the revolving disk, over which the ends of the cord are wound and to which they are fastened. Thus any motion of the disk and any change in the point of contact on the slide wire is accompanied by a movement of the pen.

Balancing of the battery rheostat against the standard

cell is effected manually once or twice a day. On multiple point recorders (more than three-point) standard cell balance is effected automatically. In that case a commutator carried on the shaft A of Fig. 6, which during each revolution connects the different thermo-couples in circuit suc-

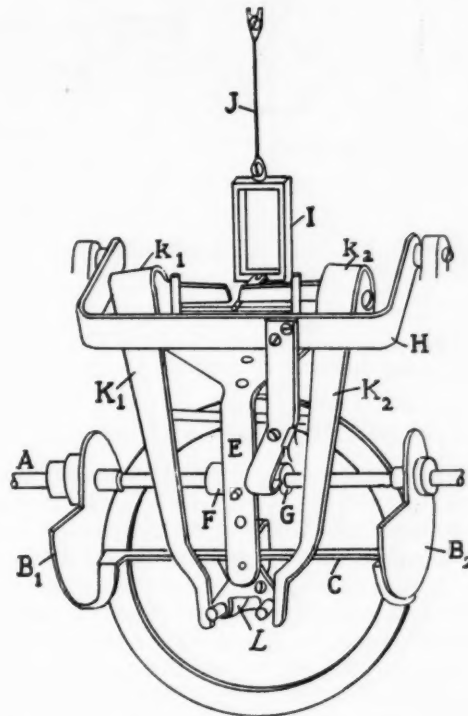


FIG. 6—Diagram of self-balancing mechanism of Leeds-Northrup pyrometer.

cessively, at one point in its revolution disconnects all thermo-couples and instead connects the standard cell in circuit. At the same time the disk carrying the slide wire of the potentiometer circuit is disengaged and another one carrying the resistance by means of which the current flow in the potentiometer circuit is adjusted, is engaged. Then, if the circuit is unbalanced and the disk is set in motion in consequence, this results in adjusting the resistance in circuit to compensate for a change in battery voltage or resistance.

Automatic compensation for changes in the temperature of the cold junction is provided also in the Brown pyrometer. Referring to Fig. 7, a Breguet spiral B made of two dissimilar metals welded together, is fastened to the hair spring S which serves to return the hand P to the zero position. A change in temperature of the instrument will cause the spiral to contract or expand, thereby coiling or uncoiling the hair spring, and moving the pointer P up or down the scale. Thus, if the temperature of the instrument should increase from 75 to 90 deg. F., the spiral will uncoil to a certain extent, thereby pulling the hair spring to the right and moving the pointer of the hand from 75 to 90 deg. on the scale, when no current from the thermo-couple is flowing through the instrument.

Compensation is made in a similar manner for the effect of temperature changes on the resistance of the instrument and, in consequence, on its readings. When the temperature of the instrument increases the resistance in circuit increases, less current flows through the instrument for a given thermo-couple temperature and voltage, and the indications are smaller. This effect is compensated for by an additional Breguet spiral L shown in Fig. 8, which has attached to it an index I used to set the pointer P when the instrument is first put in service. After this adjustment

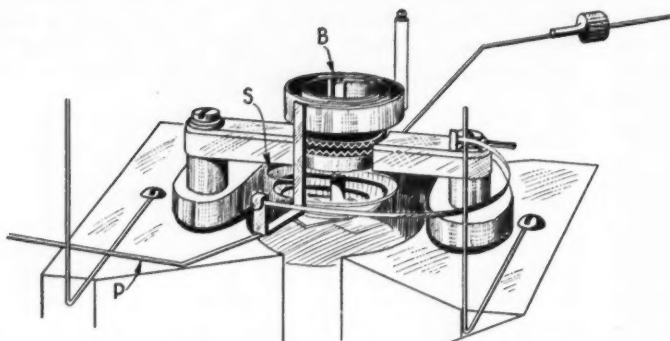


FIG. 7—Automatic cold junction compensating device used in Brown pyrometer.

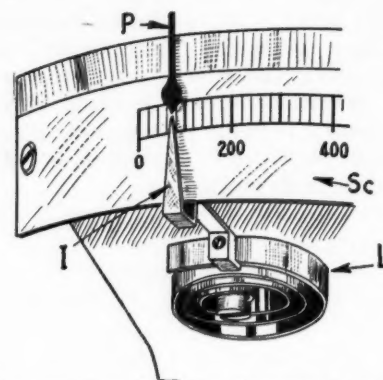


Fig. 8—Automatic compensation for changes in atmospheric temperature, in Brown pyrometer.

has once been made, both the pointer and the index always coincide when no current is flowing through the instrument.

Automatic Signalling Device

A considerable help in keeping the temperature of a furnace, etc., within the required limits is an automatic signalling pyrometer. Three electric bulbs are arranged on a base-board in such a position that they are easily seen by the furnace attendant, the bulbs being white, red and green (or blue), respectively. The circuits through these bulbs are opened and closed, either directly or through relays, by means of contacts on the pyrometer. If the temperature at the point where the thermo-couple is located is within a certain number of degrees (the tolerance allowed) of the desired value, the white bulb is lighted. If it drops below the set lower limit the hand of the pyrometer makes an electrical contact and lights up the green bulb, whereas if it rises above the higher limit the red bulb is lighted up. These signaling lights are used with both indicating and recording pyrometers. Some makers of pyrometers so arrange the signaling mechanism that the

temperature ranges over which the different bulbs are lighted overlap; that is, if the temperature is only slightly high both the white and the red bulbs are lighted, whereas if it goes still higher the white one becomes extinguished.

The development of the indicating pyrometer may be regarded as having been the first step in the endeavor to put thermal processes on a precision basis, and the recording pyrometer was the next. After a batch of steel parts has been put through a heat-treating process, the metallurgist will make his test for hardness, tensile strength, etc., which characteristics, of course, will depend upon the details of the process it has passed through, such as the heating temperature. If only indicating pyrometers are used he has to depend upon the word and the memory of the workman, whereas if the temperature is recorded by a reliable instrument he has original information on all points. Where only indicating instruments are in use it is customary to make a written record of the furnace temperatures at regular intervals, but such records can be easily "doctored."

Recording Pyrometer

A recording pyrometer comprises a clock or constant speed electric motor which moves along the paper on which the temperature record is inscribed at a uniform rate. This clock may be either the usual spring-operated type, in which case it must be rewound at intervals, or it may be an electric clock. In some forms of recorder the records are made on circular cards which rotate with the hour hand of the clock, making one complete revolution in twelve hours. The hand of the indicator swings over this card in an arc, and the time ordinates on the chart therefore are of circular arc form. Most pyrometers at the present time, however, produce a record on a strip of paper that is moved along by the clock or motor in a straight line. The time divisions on such a chart are absolutely uniform and the temperature scale divisions, which, of course, depend upon the scale of the meter, generally are very nearly uniform, giving a chart which can be read with ease and accuracy. With some forms of recording pyrometer cards of only sufficient length for a single day's record are used, but generally the paper on which the record is made is in a roll and is drawn through between rollers which are moved at a definite rate of speed by the clockwork or electric motor.

Some means must be provided to prevent slipping of the paper or chart on the drum since, if any slippage occurred, the time indications on the chart would be incorrect. In some cases the paper is provided with perforations near its edges which engage with pins on the drum, so that the chart is virtually geared to the drum. In one make of instrument the drum is provided with minute projecting points, which, owing to the pressure of the clips on each

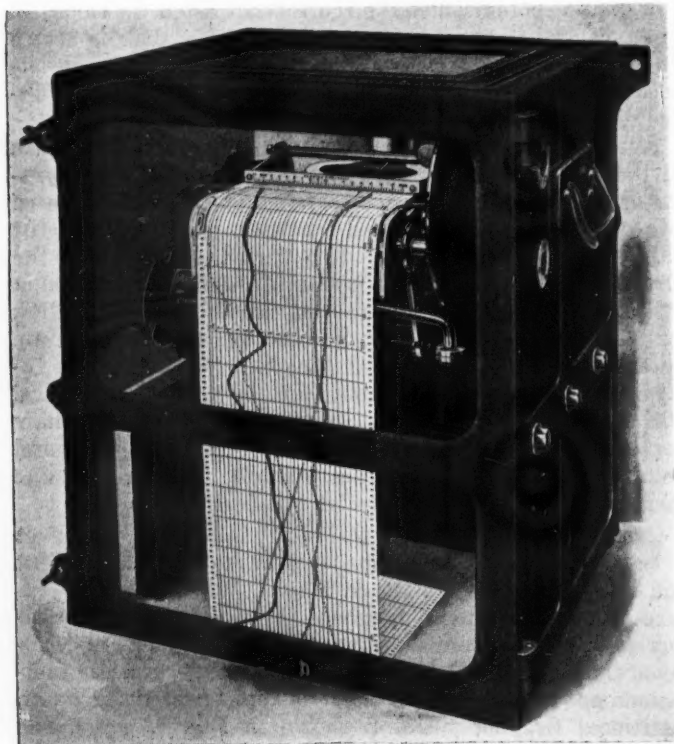


FIG. 9—Tapalog multi-record recording pyrometer.

end of the chart, dig into the paper and thus prevent its slipping.

If the galvanometer had to drag a pencil over the paper in producing the record, the latter would certainly not be very accurate, on account of the very slight power available in the thermo-couple circuits. The recording mechanism is therefore made on the intermittent, frictionless principle. At certain intervals of time, of the order of one minute, the pointer of the galvanometer is depressed by the clock mechanism against the card over a carbon ribbon or a color roller, whereby a dot is produced on the card, and successive dots are so close together as to appear as practically a continuous line. The depresser is usually operated by means of a solenoid, the circuit of which is closed and opened periodically by the clock. Carbon ribbon and color roller, of course, are moved along after each record is made, so that a new portion of the ribbon or roller is utilized each time.

Automatic Inking Arrangement

In the Thwing recording pyrometer an ink pad is provided at the side of the chart. Before a record is made, the thermocouple circuit is automatically broken by the clockwork, the hand of the galvanometer returns to zero and while in that position is depressed on an ink pad, where it picks up the necessary amount of ink for the next mark. Then the circuit is closed again, the needle assumes a position corresponding to the temperature to which the thermo-couple is exposed and is depressed on the paper. This method, however, is used only where a number of records are made on the same chart. Where only a single record is made the circuit is not broken, but the needle is brought to the inking position at the side of the drum by mechanical means.

One recording pyrometer, the Leeds-Northrup, was illustrated in Fig. 4. Another typical instrument of this kind, the Tapalog, is shown in Fig. 9.

Recording pyrometers are also made in two-point and multiple-point types for recording the temperature variations in different parts of a furnace. Either two or more separate curves are traced, sometimes in inks of different color, or the temperatures at the different points are registered by dots, each with a number alongside of it to indicate the location of the thermocouple to which it corresponds.

Coincidental Electrolock

THE Electrolock, manufactured by the Mitchell Specialty Co., Philadelphia, is a co-incidental ignition lock which has been listed as a Group 1 automobile lock by the Underwriters' Laboratories.

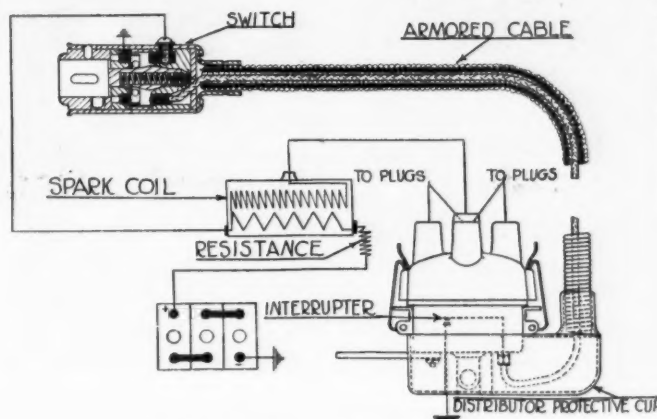
This lock is operated by means of an automatic switch which requires only a push on the locking cylinder to break the ignition circuit and lock the car. The key is used only for unlocking and a quarter turn releases the locking cylinder which then automatically springs into the unlocked position and closes the circuit.

The accompanying illustration shows how protection of the ignition circuit is secured by placing the lock switch in the circuit between the coil and the breaker points in the distributor and completely enclosing the connection between the switch and distributor in a cable of hardened steel. The distributor connections are also enclosed in a hardened steel cup so as to make mechanical access to these parts difficult.

In order to prevent defeat of the lock by means of special attachments at the distributor points the switch is so constructed that when locked the breaker points are grounded to the car frame and any current brought

through the coil to the points will return to the negative battery terminal without regard for the timing of the motor.

In coasting down hills the ignition may be shut off with-



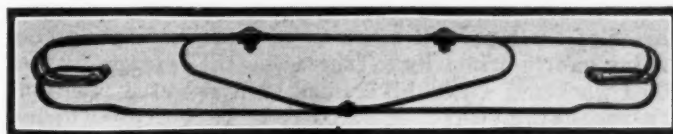
Wiring diagram of Electrolock

out the slightest danger. The car may be left locked in garages or in the street, as it may be moved easily while locked. In case the motor stalls the ignition circuit remains closed and the motor can be started at once by simply using the starter.

This lock is adaptable to all makes of cars with slight variations in construction. The use of a flexible steel armored cable permits the switch to be placed in any desired position and the simple method used for protecting the distributor simplifies installation either as original equipment or as an accessory.

New Type Bumper Introduced

THE Scissor Action type bumper, a new product of the Spring Steel Bumper Co., is said to be so designed that the force of an impact is absorbed gradually by the action of the bumper so that there is no danger of the brackets being broken or the bumper being bent out of



Scissor Action Bumper

shape. The way in which the bumper reacts to an impact can be determined from examination of the accompanying illustration. The unit is made of spring steel and will be furnished in three sizes and finishes to fit all standard makes of cars.

NEW taxicab regulations have been promulgated in Berlin. There will be admitted to traffic three classes of cabs, viz., large motor cabs, small motor cabs and motorcycle cabs, the latter only tentatively at present. The first mentioned class will carry a triple white and black chequered belt, the second class a double and the third a single one. The cars will be finished in dark green below the belt and black above it.

All of the cabs carry the same taximeter, but while drivers of large motor cabs can demand the full indicated charge, those of small cabs can ask only 75 per cent and drivers of motorcycle cabs only 50 per cent.



1. A high-capacity elevating platform truck placing a die in a press. 2. An electric truck handling cylinder blocks on skids

Trucks Reduce Material Handling Costs in Automotive Plants

Application of storage battery equipment to shop hauling yields high returns. One company cuts its costs 97 per cent.

By Harold J. Payne

The Society for Electrical Development

THROUGHOUT the automotive industry it is now commonly accepted that efficient production depends upon sound methods of material handling. Time was, only a few years back, when this truth was far less apparent. When hand-truckers were available at one-quarter of their present wage there was justification for bending efforts primarily to increasing the capacity of the skilled workman whose high wage then reflected itself in high processing costs. Machine tools have proved to be very largely the answer to that difficulty.

As was recently pointed out in *Automotive Industries*, however, 90 per cent of the effort involved in building an automobile is devoted to handling and but 10 per cent goes to actual process effort. Hence the increasing necessity, already recognized and being acted upon, to provide the unskilled worker with tools that will allow him to do his work at lower unit cost. Already long forward strides have been made in this direction. As with other developments based on a pressing demand that does not let up, there is definite need for continuing progress in order to effect further cuts in the non-productive cost that is involved in material handling.

Storage Battery Truck and Tractor

As one means to this end the storage battery truck and the tractor have been put into service on a large scale, especially during the past five years. A recent survey, made primarily to establish the facts with regard to the manner of application and to the savings effected by this type of equipment, reveals that it is rapidly expanding in relative importance as a means of cutting handling

costs. One plant, for instance, has cut this item from \$5 per car five years ago to 17 cents per car at present, entirely through the use of electric industrial trucking equipment.

In one line of cars that includes several models, an average of 4,000 parts weighing 2700 lb. have to be handled an average of 10 times from the point of receipt in the plant to the point at which they enter the assembly line. These parts include the widest variety of materials—yet only that variety handled in every plant. Plate glass, frame members, cylinder blocks, upholstery, cotter pins, axles, tires, batteries, accessories of all kinds as well as many types of waste material have to be kept flowing regularly through 90 departments located in scattered buildings of from one to four stories. As in all plants having a production of several hundred cars per day, the total manufacturing area includes many acres.

Formerly each department had its own crew of hand truckers. Four-wheel shop trucks were used very largely for moving the various materials which were kept, as far as possible, in steel barrels. The first step made toward the application of power to trucking was the purchase of tractors to move these shop trucks. These tractors then became a direct auxiliary to the industrial railway on the ground floor, which is still used for long hauls of material moving in considerable quantities. Out of this development a centralized transportation department grew that has now taken over supervision of material handling for the entire plant.

The present fleet at this plant consists of 12 tractors, 70 elevating platform trucks of 3 ton capacity, 3 crane

trucks, 12 tier lift units and 2 straight platform trucks. Reinforced steel skids, 9,000 in number, have largely displaced the steel barrels that were formerly employed as containers. These skids are box shaped and fitted with eyes so that they may be handled by overhead cranes in the storage areas—being built up into tiers of six or eight by this means. As far as possible material is kept stored in these skids from the time it enters the plant until it leaves in the shape of an assembled car.

Flexibility One Advantage

It is impossible to outline in detail the operation of the trucks because of the wide range of assignments made to each unit as occasion demands. Flexibility is one of the principal advantages found in the use of a mobile power unit of this kind, which of course is capable of working over the entire plant. This is directly reflected here by shifting operations as production centers or as process operations are changed or modified. Ordinarily, however, each truck driver is assigned to certain definite jobs for which he is responsible.

The crane trucks are largely used in shifting or moving machinery about the plant, being employed by the millwright department for work of this kind practically all of the time. In this work it has been found that each truck is releasing 30 laborers for other jobs about the plant.

The tier lift trucks spend most of their time either in the heat treating plant or in the press division handling heavy dies. In either of the latter types of service the earnings for each unit average close to the wages of 12 men.

The elevating platform trucks are purchased on a basis of effecting a saving of at least \$6,000 a year, but actual performance indicates that this figure is generally exceeded. This holds also for the tractors.

The net fixed charge against each unit averages slightly less than \$3.50 per 8-hour day. This figure of course includes power, depreciation, interest, insurance and maintenance. This latter item is minimized through a system of thorough steaming and lubrication of each machine twice a month. Despite heavy service and frequent operation under loads exceeding rated capacity, the life of this equipment at this plant is known to be at least nine years.

It is not to be assumed from this presentation of the part taken by the electric truck in this scheme of opera-

tion that other types of material handling equipment are not used. Complexity has been avoided as far as possible, however, and a definite effort has been made to keep the amount of equipment at a minimum.

In the motor assembly department, for instance, a continuous monorail conveyor system is used to excellent advantage. Because conveyor systems are known to be worthwhile only when operating very nearly at capacity, and when production demands are such that once installed there will not be the necessity for modification, they have not been adopted here very generally. Gravity is used wherever possible.

In the machine departments, rehandling is minimized by so arranging the tools that work may flow through a series of operations without the need of any conveying. Invariably such series of operations are banked on the starting side with several skid loads of raw material and when the finished job has to be further worked, skids are provided at the end of the line for carrying the work away. In this way delays are avoided although the flow of work into the department may be intermittent.

The introduction of this system, incidentally, makes it readily possible for a given trucker to take care of much more handling than would otherwise be possible. Also it makes more effective every available foot of working area. When one electric truck carries from six to twelve times the load of a hand truck at several times the speed, the relief in congestion becomes distinctly noticeable.

Enormous Production Increase

In this particular plant the present system of inter and intra plant transportation is held largely responsible for making possible an increase in production of 175 per cent with an increase in manufacturing area of only 33 per cent. At another plant production has been increased 500 per cent with an actual decrease in storage area of 33 per cent and with an increase in manufacturing area of only 25 per cent—again in this case the electric truck is held to be the means of effecting this increase in efficiency.

When asked to crystallize his motives in going so fully to the electric truck as a means of material handling, the executive in charge of material handling at the plant whose practice has been largely discussed here stated the facts as follows:

1. An electric truck and skids eliminate rehandling in the press room. 2. A tractor used for moving assembled motors to car assembly line. 3. Hauling rims on trailers



1. Storage battery electrics enable us to meet rapidly shifting manufacturing conditions without purchasing new handling equipment.

2. They lower labor turnover because they make it possible to increase the trucker's wage and to make his work very much more agreeable.

3. They give us the speed and capacity required to lower congestion, increase effective storage areas and to decrease inventories of stock.

Because of the constant pressure to decrease indirect labor charges, another plant is now going to a 10-ton capacity elevating platform storage battery truck on the basis of a very material decrease in its present cost of handling. The possibility of further conserving floor space, of further eliminating rehandling and of further increasing the capacity of the trucker under this significant trend.

At this plant an effort is made, so far as possible, to maintain storage areas close to the points at which process work begins. The handling of raw steel is the only problem that has not been worked out with electrics at this plant at the present time.

The fleet consists of the same types of equipment as those already mentioned and the general manner of operation is much the same—except that steel barrels and tote pans, with skids of various types are extensively used instead of a standardized box container. One very large saving that has been made here is the maintenance of perpetual inventory through the practice of maintaining skid loads unbroken from the time they are taken into the plant until they enter process. Tote pans are used for smaller parts, being carried to the point of use by the trucks.

Where springs, crank-shafts, bodies, glass, axles, tires and batteries are made, as in practically all of the other plants that supply car builders with essential parts or materials, the electric is playing an increasingly important part. Conditions, such as exist at present, with competition in all lines keen, and with the unskilled labor problem most pressing for solution, justify a constantly increasing application of modern material handling equipment. The trend toward the industrial electric as an important link in the systems being developed, under these circumstances, is entirely logical.

High Efficiency Claimed for New Two-Stroke Engine

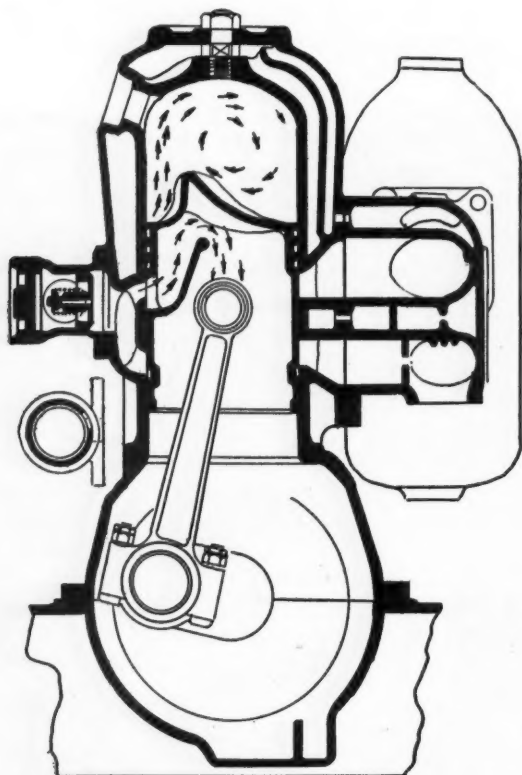
A TWO-STROKE engine for which exceptional efficiency at part load is claimed has been developed by James McIntosh of Cleveland, Ohio, for marine purposes, and the McIntosh Engine Co. has been organized to manufacture it. A section through one of the cylinders is shown herewith. On the left in the drawing there is a transfer port in the cylinder wall. The piston is shown on the up-stroke, at that position in the stroke where it has attained its maximum upward speed, and the transfer port is fully opened by a port in the piston wall. At this time, since the piston has completed more than half the up-stroke, there is a considerable degree of vacuum in the crank chamber, and air therefore

rushes into the crank chamber through the automatic inlet valve of the poppet type and the hand-controlled rotary "mixture control" valve.

As the piston approaches the end of the upward stroke, the inlet port in the cylinder wall (the lower one of the two ports on the right hand side) is uncovered by its lower edge, and a gas mixture from the carburetor then enters the crank chamber through this port. The amount of fuel charge admitted depends upon the degree of vacuum in the crank chamber at the time the inlet port opens, and this is controlled by means of the air valve.

On the down-stroke (which is the power stroke) as the piston approaches the lower end of the stroke, the first thing that happens is that the exhaust port, on the right in the drawing, opens, and some of the exhaust products are expelled through it. A moment later the top edge of the piston uncovers the top port of the transfer passage, while the lower port of the same passage is uncovered by the port in the piston wall. The charge in the crankcase having been compressed by this time, begins to flow into the combustion chamber and to displace the remaining burnt gases there. Mr. McIntosh states that what enters the combustion chamber first is the content of the transfer passage and the piston, and this consists largely of air. Toward the end of the inlet period the gas mixture will pass over, and he figures that the flow will take place as indicated by the arrows. That is, a vortex action is set up which will carry the air or lean charge that entered first, into the center of the combustion chamber, and bring the rich charge that entered last into the vicinity of the spark plug and thus insure positive ignition.

Among the advantages claimed for this engine are that high compression can be employed at full load without fear of detonation, and that the same compression can be maintained at part load, which tends to keep up the thermal efficiency at part load. The expectation of a higher thermal efficiency from this engine is based also on the absence of pumping losses. It would seem, however, that, since the crankcase is used as a pump and the air control valve is used as a throttle, these losses are not entirely eliminated, but they probably are considerably less than in a conventional four-stroke engine running closely throttled.



Cross-section of McIntosh two-stroke engine

Just Among Ourselves

"A Top Hat, a Frock Coat and a Cane?"

IN an old scrap book, Sir William Letts, head of the Willys-Overland interests in England, says he has a clipping from an American paper published at the time of the first automobile show in Madison Square Garden. "Sir William Letts," the clipping reads, "was a prominent figure at the show equipped with a top hat, frock coat and cane." For American show purposes today, Sir William says, he has discarded the top hat and the frock coat, but he still carries the cane—for protection. Nevertheless a number of Sir William's countrymen have stuck to their usual raiment apparently, as top hats and frock coats were seen frequently in the mornings about the hotels in New York last week where guests of the World Motor Transport Congress were stopping.

* * *

Design Governed by Domestic Needs

"IT will always be found that the productions of a country are governed in design by the conditions in the country itself," says Edmund Dangerfield in an editorial in a recent issue of the British magazine *The Commercial Motor*. And we think Mr. Dangerfield is right. American automobiles with their relatively high speed and quantities of power were developed primarily for conditions in this country. Happily the need for similar characteristics in motor vehicles exist in a number of other countries. As a consequence America's automotive foreign trade has prospered very greatly, often to the detriment of some of our foreign competitors. Mr. Dangerfield's remark was made as regards the preference of Australians for American-built

buses over British built buses in many instances. The British vehicles, he points out, were built for the good roads and operating conditions of England, while the requirements in Australia often are quite different. In terms of Mr. Dangerfield's expression many of the successes and failures of American automotive manufacturers in foreign markets can be interpreted. The small success attained thus far by American attempts at light car production may be a case in point.

* * *

Brass Tacks Fairly Common in Recent Speeches

WE'RE pleased to be able to report progress in the campaign for shorter and better speeches. Attended a full quota of dinners and several sales meetings during New York Show week and can't recollect but one case in which the orator felt it necessary to trace the history of automotive development during the last 25 years before starting in on what he had to say. The man with a one-hour talk on a nine-minute subject was rather scarce in Gotham during the big doings. We didn't hear anybody mourning at his absence either. Long may he live—a long way from automotive gatherings: (By the way, we'd like to take credit for that phrase about "a one-hour talk on a nine-minute subject," but somebody else might have heard E. St. Elmo Lewis use it one time or another and then we would be caught.)

* * *

Unsuccessful Competition Hurts More Than Rivalry

ONE big automotive manufacturer said the other day that he worries a lot more about fading, unsuccessful competitors than he does about live,

successful rivals in his field. Companies making a product based on the same principle as his hurt his business materially, he feels, when they go bankrupt or fail to make good; they cast a reflection on the type of product as a whole which hurts all the manufacturers producing it. This point of view adds another commentary to the inadvisability of knocking a competitor's product while trying to sell your own. Some whole industries have made going hard for every company involved by each organization spending so much time proving its own product better than its competitors that the constantly decreasing interest of the buyers in any product of the type has been lost to view. Usually the long view is the strong view.

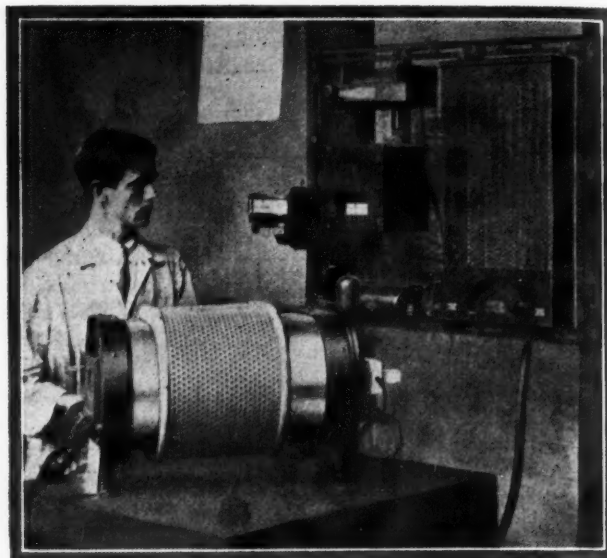
* * *

What About Competitors' Names?

JUST heard of a truck sales outfit the other day which has a policy of never mentioning a competitor's name in its selling effort. Salesmen are instructed in this policy and carry it out consistently. This same theory was expounded by an experienced advertising man who dropped in recently. He applied it to sales promotion work. "Mentioning a competitor's name in promotion or advertising efforts just gives him that much free publicity and indicates also that you rate him of considerable importance," argues this particular merchandising expert. The comment originated because we had just referred to what we considered an unusually good piece of promotion matter which did mention competitor's names. It was a point that hadn't occurred to us particularly before one way or the other; we've had some fun thinking about it since.

—N. G. S.

Magnetic Indicator is Designed to Control Hardening Furnace Temperatures



Wild-Barfield electric hardening furnace and control board

Produces musical sound until steel ceases to be magnetic, which is considered correct temperature for quenching.

WHEN steel, in being raised to a high temperature, reaches its so-called critical point, it loses its magnetic properties, and this fact is made use of in the Wild-Barfield automatic hardening furnace manufactured by Automatic and Electric Furnaces, Ltd., 173 Barrington Road, London, England.

According to this manufacturer, hardening by temperature measurements alone involves certain difficulties. The temperature at which the steel is quenched must, of course, be exactly correct, for even a slight overheating produces a coarsening of the grain, with consequent reduction in strength and ductility, while a slight underheating is accompanied by the development of soft spots and general irregularity of structure.

However, the temperature to which steel must be raised for most effective hardening is not constant, but varies with the nature of the steel and with the rate and the duration of heating. Therefore, if the hardening process is controlled according to temperature indications, the composition of the steel must not vary; the charge must remain in the furnace for a given time in relation to its weight, and the rate of heating must be controlled in accordance with a given schedule.

Austen's Principle

Roberts Austen in 1897 is said to have shown that the correct temperature for quenching steels containing 0.40 per cent or more carbon is that at which the steel ceases to be magnetic. His equilibrium diagram showed three critical points on the heating curve, as follows: The AC_1 point at which the formation of the solid solution begins; the AC point where the steel loses its magnetic properties, and the AC point where the diffusion of cementite is complete and the steel is ready for quenching.

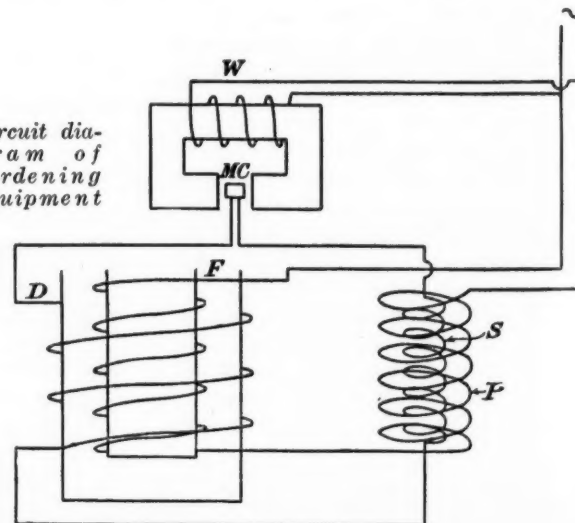
It was also shown by Roberts Austen and confirmed by K. Honda and others that for steels of more than 0.40 per cent carbon content the AC_2 and AC_3 points coincide, and for steels of more than 0.90 per cent carbon all three critical points coincide. The steels for which the AC_2 and AC_3 points fall together are said to include all com-

mercial cast or carbon steels and all but the higher alloy steels, and for these the AC_2 point or point where the steel becomes non-magnetic, is also the correct quenching point.

The Wild-Barfield electro-magnetic steel hardening equipment consists of an electrically heated furnace and a control panel electrically connected thereto. The furnace consists essentially of a refractory chamber surrounded by a closely wound helix of electrical resistance wire, and a current sent through this helix generates the necessary heat. A controlling resistance in the circuit of this coil permits of varying the strength of this current and thereby the heat of the furnace. Superimposed on this main heating winding is a secondary or indicator winding, electrically connected to the magnetic indicator on the control panel. The whole furnace unit is heavily lagged to reduce the heat losses, and is surrounded by a substantial case of polished aluminum with end castings of iron.

The control panel carries the magnetic indicator by which a visual indication of the magnetic condition of

Circuit diagram of hardening equipment



the charge is given to the operator; the regulating rheostat for controlling the temperature of the furnace; the warning lamp of the excess temperature cut-out, and a pyrometer for regulating the super-heat of the furnace.

Referring to the circuit diagram Fig. 1, *F* is the primary or heating winding on the furnace chamber; *D*, the secondary or indicator winding; *S* and *P* are the primary and secondary windings of a compensator coil; *Mc* is the moving coil of the magnetic indicator, which has attached to it a pointer moving over a scale, and *W* is the winding on an electro-magnet between the poles of which the coil *Mc* moves.

Alternating current being used for the heating, normally an electromotive force is induced in *D* which is opposed and neutralized by an equal electromotive force induced in *S*. However, as soon as a piece of steel is introduced into the furnace the electromotive force in-

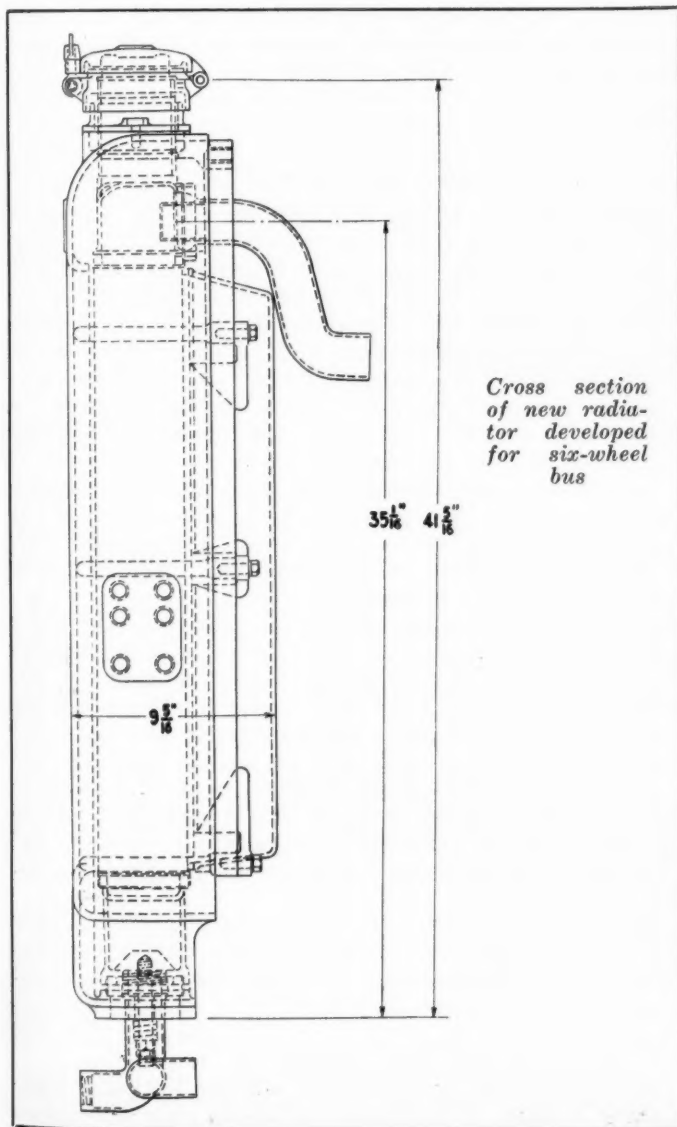
duced in *D* is increased, so that it overcomes the electromotive forces induced in *S*. The difference in the two electromotive forces results in a flow of current through the instrument coil *Mc*, causing the pointer to move over the scale and up against a stop. As long as the steel is in the magnetic state the pointer vibrates against this stop, producing a musical note.

When the steel has nearly lost its magnetic qualities the pointer leaves the stop and moves slowly down the scale, reaching the zero mark when the steel becomes completely non-magnetic.

The Wild-Barfield furnace is also fitted with an excess temperature cut-out. This consists of a fuse which blows whenever the temperature becomes sufficiently high to endanger the heater windings. When this occurs a red pilot light on the control board is lit up, thus giving a signal to the operator.

New Radiator Developed for Six-Wheel Bus

A NEW radiator designed particularly for motor bus service where frequent stopping and starting make proper engine cooling a difficult task has been developed by the Six Wheel Company and is being built to their specifications for use on their bus chassis by the United States Cartridge Company.



This radiator is fitted with a re-flow tank which allows condensation of water and prevents the water supply from becoming low in hot weather, and also prevents loss of anti-freeze mixture during winter operation. This re-flow tank is considered necessary in climates where the temperature reaches and stays near 100 deg. F.

Around the inside of the radiator shell there is a cast aluminum shroud which throws the entire air flow directly against the cylinder walls of the motor and dispels heat much more rapidly than the ordinary type of radiator. This shroud is of cast aluminum, very light but strong enough to reinforce the shell casting and prevent cracking at the rounded corners. The shell is mounted on a flat piece of steel which is directly attached to the frame. The core is mounted inside of the shell on rubber pads which absorb vibration and shock. The radiator filler spout goes through the shell but is not attached rigidly to it. This construction permits the core to float in the shell and in the event of a twist in the shell, no stress is transmitted to the core or its tanks. This construction saves the core from shock and permits quick change in case of accident.

The top and bottom tanks of the core are cast brass, which prevents leakage at this point. These cast tanks, upper and lower, are soldered to the core. Owing to the special construction of the top and bottom rows of tubes in the core, a $\frac{3}{8}$ in. soldering surface all around the tanks is secured.

The new core is of the type as is now extensively used by the army in aviation work. It is practically impervious to damage by freezing, difficult to puncture by stones, and has even withstood puncture by fan blades in the case of fan bracket failure.

This new core represents an economy from the standpoint of the operator, because new tubes may be installed by an ordinary mechanic with a soldering iron, and the circulation will remain the same as it was originally. This is due to the fact that the core is made up of individual tubes, the ends of which are expanded and soldered on the outside. Since these tubes are of seamless brass, in the event of damage on the road, they can be plugged front and back by wooden plugs, and the driver may continue for an almost indefinite period without further leakage.

The capacity of the new radiator is 25.75 qt. Installed on the 14-H engine used by this company, the total water capacity is 11 $\frac{3}{4}$ gal. Installed on the 12-T engine, it is 11 gal.

Extra Effort Will be Required to Keep Used Cars Moving This Year

New complications are added to an old problem. Liberal new car sales terms have had detrimental effect on market for trade-ins. Situation calls for close attention of factories.

THE used car—for many years an automotive bug-bear—seems destined to be a most important factor in 1926 merchandising.

Can used car stocks be kept down in the next twelve months and new car sales continued at a high rate at the same time? That is the industry's aim. To hinder its realization several barriers appear as the industry enters the new year:

1. Extremely liberal financing terms on new cars, coupled with a rather general maintenance of conservative methods in financing used cars, have begun to interfere seriously with the sale of the latter vehicles in many areas.

2. Used car stocks began to pile up in some parts of the country about two months before the end of 1925.

3. Used car sales slowed down materially before the new car demand sloughed off last fall.

4. Low new car prices also have affected adversely used car conditions. Further price cuts would hurt used car sales profits even more, but increases might help the situation to some extent.

5. Practically all of the circumstances which in the past have made profitable used car selling difficult still are in effect in addition to the new phases outlined above.

Improved methods of handling used car sales, special merchandising plans which have been put into operation, reconditioning policies tending to create confidence in the rebuilt product and other factors have improved the used car situation basically during the last few years. But even those dealers and distributors who have been most successful in moving used cars lately have had difficulty in making a profit out of the effort put into this end of the business.

Not Solely a Dealer's Problem

The difficulties involved in the question are being recognized more fully every year by car manufacturers and the attitude, common a few years ago, that the used car is a dealer's problem solely, no longer is common at the factories. Used car departments have been established by several manufacturers and are contemplated by others. These departments devote their entire time to helping dealers find ways and means to move used cars at a profit.

Need for continuation and extension of activities of this kind is indicated by study of the existing situation in retail financing especially.

The extension of low down-payments and long terms

on new car sales last year was the most important new factor brought into the used car situation. In concentrating attention on financing arrangements and plans in connection with new car sales, it almost seems as though the used car was forgotten for the time being. Now it is beginning to force attention again.

Obviously used car sales are difficult to make if terms on new cars are such as to permit purchase of the new product with about the same down-payment and about the same monthly payment as purchase of the used vehicle. Yet financing arrangements on new cars have been pushed forward without sufficient attention having been given to their effect on the used car market.

And there isn't much doubt but liberal new car terms have already had an ill effect on used car sales.

Dealers Give Their Views

Something like 78 out of every 100 dealers will bear witness to the fact that low down-payments and long terms on new cars have made it much harder to sell used cars at fair prices in recent months. This is indicated by replies to a questionnaire just received from several hundred wholesalers and retailers in all parts of the country. The answers all came from dealers handling well-known standard makes of cars and were sufficiently scattered to give a reasonably good cross-section of opinion in every territory.

Twenty-two per cent of those replying say that used car sales have not been affected by the recent liberal trend in new car terms. The other 78 per cent say, with varying degrees of emphasis, that used car sales have been affected by that trend.

One positive-speaking distributor says that "the effect (of low down-payments and long terms on new cars) on the used car market is going to be tremendously disastrous. Anyone with the least understanding of simple mathematics," he argues, "can see that the average used car prospect would be a fool to buy a used car that requires 40 per cent down-payment with 12 months to pay the balance when he might buy a new car 20 to 25 per cent down and 18 or 24 months to pay the balance." And that distributor isn't from the Pacific Coast either. He's from Ohio.

His emphasis on this question is confirmed by another prominent distributor from Colorado who voices the opinion that "Most assuredly small down-payments and long terms have made it harder for us to sell used cars at a fair price." He thinks also that "the situation will be particularly bad after the first of the year."

And C. E. Gambill, president of the National Automobile Dealers Association, backs up this conception

with the statement: "Less than one-third down-payment affects seriously the sale of used cars and the used car problem is now—and always will be in my opinion—the most serious factor in selling new cars. Nothing should be done to add to the sales resistance of used cars."

Another Colorado dealer thinks that this is one phase of the merchandising problem that manufacturers and dealers are overlooking when they condone extremely low terms on the sale of new cars. He believes that "it will ultimately cripple the industry, because it will almost eliminate the sale of used cars at anything like a fair price, with the result that these used vehicles will be thrown on the market at a tremendous loss."

These are representative of the ideas of about 78 per cent of those who gave their opinions at the request of the Chilton Class Journal Company a week or two ago. The view of the remaining 22 per cent is typified by the following statement from a Michigan distributor, who says:

"We do not find that longer terms that have been offered on new cars have had any effect on our used car sales. These long terms, however, are not being forced as much as they were a few months ago."

A Significant Point

The latter part of this statement carries a significant point. If financing terms are held or brought to a conservative basis in 1926, much of the immediate pressure hindering used car sales may be removed. Shortly before the end of 1925 there were indications that a movement in this direction had started, although it cannot yet be said to have gone far enough to insure conservatism during the coming twelve months, particularly if competition became very keen.

In any case, the used car must be considered equally with the new car in financing plans for this year. A survey made a few months ago by A. V. Comings, editor *Automobile Trade Journal*, indicated that the proportion of new used cars sold by dealers is about as 1: 1½. That means that when the dealer in 1925 sold 3,200,000 new cars in the United States they sold in the same period about 4,800,000 used cars. To fail to give major consideration to used car merchandising in sales and financing plans under present conditions is to let the tail wag the dog.

1925 Biggest Federal Road Year

IN his annual report the Secretary of Agriculture states that 11,329 miles of Federal-Aid roads have been completed during 1925 with other projects of an aggregate length of 12,463 miles under construction. Some of these have been partially completed but will not be so reported until the entire project is finished. This is a record for construction and brings the total length of Federal-Aid roads completed since 1917 to 46,486 miles.

The total cost of the projects completed since the war has been more than \$845,000,000, of which the Federal Government has paid approximately \$373,000,000. An interesting statement in regard to the extent of motor vehicle taxation is: "As the Federal excise taxes on motor vehicles, tires and accessories have produced since 1918 Federal revenues amounting to \$800,000,000, it may be seen that the Federal-Aid highway expenditures have been far more than paid by owners of motor vehicles. The same motor vehicle owners contributed to the State treasuries in license fees and gasoline taxes during the last fiscal year more than sufficient funds to pay the States' share of the

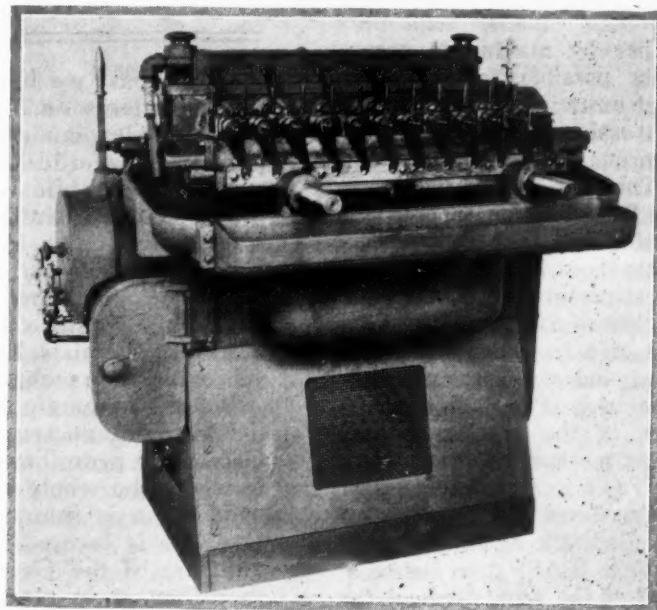
cost of the Federal-Aid roads in all States with the exception of New Mexico."

The department is carrying on investigations looking to the discovery or development of a rubber plant which can be grown and made to produce commercial rubber economically in the United States and tropical America. It has been found that several rubber plants grow well under our conditions but other species or varieties may be found that yield more or better rubber or are better adapted for cultivation under our conditions. Studies of methods of rubber production more suitable to our labor conditions than are those of the East Indian plantation system are also being made so that when a suitable plant is found methods of cultivation and tapping will also be available.

Kent Six-Spindle Driller

THE Kent six-spindle driller, manufactured by The Kent Machine Company of Kent, Ohio., is a semi-automatic, horizontal, multiple spindle machine designed with standard fixtures for drilling holes in bolts, pins and other circular or hexagonal pieces, six at a time. There are twelve fixtures on the drilling table. These twelve fixtures are so located that six of them are in operation at one time, directly in front of the six drill spindles with the work automatically clamped in place. While six of these fixtures are in front of the drilling spindles, the other six fixtures are automatically unclamped and, while the drilling operation is taking place on the six fixtures in front of the drilling spindles, the workman is unloading and loading the other six fixtures.

After the drilling operation has been accomplished and the drill has been withdrawn from the work, the table automatically shifts, bringing the second set of fixtures



Kent six-spindle driller for drilling holes in bolts and pins

in front of the drill spindles, at the same time automatically locking in place the work in these fixtures and unlocking the work in the fixtures which have just been drilled. The operation of unloading and loading these fixtures is then accomplished by the operator, while the second set of parts is being drilled. After the second lot is drilled, the table is again shifted and the cycle of operations started once more.

Synthetic Motor Fuels—Has Europe Found the Formula?

German expert says there is no longer any doubt as to chemists' ability to produce quality heat units from cheap materials and only question now is "How can it be done to the best advantage?"

By Wa. Ostwald

THE economic value of fuels (using the latter term in a broad sense) does not depend solely on the quantity of heat energy contained but to an even larger extent upon the quality of the heat units. The quality referred to is an inverse function of the technical efforts which must be made to convert the heat units into mechanical energy.

Benzol, for instance, can be readily converted into horse power-hours and therefore is particularly valuable. The characteristics of "quality heat units" further include freedom from injurious (that is, technically undesirable) properties, such as a tendency to detonate and to cause incrustation of valves and dilution of crankcase oil. The difference in the valuation of quality heat units and ordinary heat units is very considerable. For instance, while a million B. T. U. in benzol at present cost about \$3 (German prices), the same amount of heat energy in gas oil costs only 60 cents and in coal only 18 cents. This naturally suggests the idea of "de-throning" quality heat units either by making it practically possible to use cheap heat units in the engine or by converting cheap heat units into quality heat units.

The first method has led to the Diesel engine, the hot bulb engine and the use of heavy fuels in carburetor engines—developments with which all engineers are familiar. What has been less known so far is how industriously chemists have been at work on the solution of the problem by the other method. Only the surprising announcement of Privy Councillor Duisberg of the Badische Anilin und Soda Fabrik (BASF), on the occasion of the acquisition of the Stinnes-Riebeck firm by the "Badische," as well as the shock to the American wood alcohol industry through the importation of large quantities of synthetic alcohol into the United States, directed general attention to this work.

Conversion of cheap heat units into quality heat units seems to be correct in principle

and quite practical; it appears to be much better than the alternative plan, which practically amounts to effecting the conversion in the engine itself.

From the chemical standpoint and from that of energetics, too, such conversions at first sight seem very simple. All of our motor fuels consist principally of carbon, of a little hydrogen, in addition, in some cases, of a little oxygen and, finally, in the case of most of them, of a slight excess over or a slight deficiency from the chemical energy which carbon and hydrogen naturally possess.

According to thermo-dynamics, it practically does not matter with what fuel we produce the high pressure, red-hot gas mixture which, expanding, presses against our pistons and performs mechanical work. Exhaust gas analysis teaches us that the quantitative and qualitative differences of the gases of combustion from different motor fuels are remarkably small. And a careful consideration of the process of combustion necessarily leads to

the conclusion that the very expensive special character of the quality heat unit disappears as soon as the combustion is substantially completed—in Diesel and hot bulb engines entirely and in the carburetor engine almost entirely.

When the problem is regarded from this angle it looks as though humanity so far, like the barbarian, had made use only of such quality fuels as happened to be ready made. The gasoline which happened to be present in petroleum in the most available state, was used, and the benzol, which happened to be a by-product in the manufacture of coke, offered itself as motor fuel. The problem then was to start out with the definite purpose in view of producing from the available (and, if possible, domestic) raw materials, the motor fuels which are recognized as technically particularly valuable.

The most obvious method consisted in increasing the yields of the processes already in use, as by the absorption

IN the past we have occasionally printed brief items on the work which is being done by German chemists with a view to producing volatile liquid fuels, suitable for use in automobile engines, from coal and other plentiful raw materials. Most of this information came to us indirectly through French channels.

As the problems involved are largely chemical in nature and the men doing the work are chemists, little has appeared on the subject in the mechanical press hitherto.

We are fortunate to be in position to publish herewith an article from the pen of Wa. Ostwald, a prominent German fuel chemist, in which the whole subject of synthetic fuel production is interestingly reviewed. Mr. Ostwald is located at Bochum, the headquarters of the German benzol trust, and therefore is in close touch with developments in the field of gasoline substitutes.

Additional interest is lent to the subject by the fact that one of the by-products of this search for artificial motor fuels, synthetic methyl alcohol, has been imported in large quantities into this country and has caused great worry to our wood alcohol industry. The article appeared originally in *Der Motorwagen*, to which publication credit is given herewith.

of natural gas and the cracking of low volatility petroleum distillates. In the production of benzol the absorption processes also were improved, and thus considerable quantities were recovered which formerly were burned with the gas.

The second method consisted of searching for new raw materials which might prove suitable for the production of quality heat units. This led to the experimental application on a larger scale of the low temperature carbonization process (which formerly had been used in connection with lignite on a small scale only) to lignite, coal and peat. This process consists in the heating of the raw material to a moderate temperature, under exclusion of atmospheric air, in ovens, generators or rotary drums. Lignite gasoline is manufactured in this way.

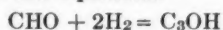
Yield of Low Temperature Tars

A study of the low temperature tars thus obtained showed, however, that only a small quantity of highly volatile fractions of useful characteristics could be recovered, while on the other hand, the process yielded enormous quantities of material for which there seemed to be no practical use. Many attempts were made to convert these undesirable oils by cracking, many different processes (Blumner, Graefe, von Walther, etc.), but the result generally was an ill-smelling fuel which tended to carbonize the valves. Again the mistake had been made of merely taking what already offered itself ready made, without systematically working toward the goal of the quality heat unit.

Now, wherein lies the difference, when the carbon and hydrogen contents vary only slightly and there is little difference in the energy content? The differences are of a chemical nature; they reside in the structure of the molecule, in its chemical constitution. And this can be purposely and logically built up by methods in use by chemists.

There are two absolutely different plans which can be followed. One consists in breaking up the molecules of the cheap (and domestic raw material into their atomic units and build up the desired chemical structure (i.e., quality motor fuel) from the elements or, again, one can take raw materials that happen to be available and reconstruct these chemically as desired. Both methods have been tried and both have led to some notable results.

The "bricks" with which the chemist prefers to work are gases. Gases are subject to particularly simple chemical and physical laws. With our highly developed mechanical equipment gases are easily handled technically. Thus the idea readily occurs to convert coal by means of the generator gas and water gas process into gaseous carbon monoxide and hydrogen. These gases can be readily purified and, if required, they can be either wholly or partly separated. Now, it was discovered by the Frenchman Sabatier a long time ago that by passing a mixture of carbon monoxide and hydrogen over newly reduced metallic nickel at less than 330 deg. F., there is produced methyl alcohol according to the equation.



The Russian Ipatiew discovered—also a good many years ago—that by the use of very high gaseous pressures in such processes the yield may be greatly increased and the reaction accelerated, as would have been expected from well-known chemical laws. The Badische Anilin und Soda Fabrik has been also developing this field technically for many years. In the synthetic production of ammonia at high pressure and high temperature according to the Haber-Bosch process it had acquired much special experience along this line. Thus, the concern succeeded—naturally only after years of systematic chemical and engineering work—to develop the quantity production of synthetic methyl alcohol by the catalytic pressure process,

using zinc compounds as catalysts (Mittasch process). The firm produces methyl (wood) alcohol from coal on a large scale.

Wood alcohol, although its heat value is relatively low, is a highly volatile and otherwise attractive fuel. In spite of its low heat energy per pound it would be a very important domestic motor fuel if it were not dangerously poisonous. It causes blindness, as the well-known German and American synthetic whiskey blindness cases have shown. Special investigation of American scientists have confirmed the fact, also noted in German literature, that the purest synthetic alcohol also possesses this property, which, therefore, is not imparted to wood distillate by impurities. Now, since it is practically impossible in the operation of motor vehicles—especially trucks—to prevent the inhalation of fuel vapors, methyl alcohol cannot be considered as motor fuel.

But a breach has been struck. What is possible today with methyl alcohol will be made possible tomorrow with the non-poisonous and more advantageous acetone—to mention only one of the numerous possibilities.

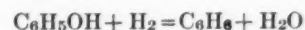
It is interesting in this connection that the high pressure process of the Badische Anilin und Soda Fabrik gives rise to a strange brownish fluid, iron carbonyl, which has anti-detonating properties like the poisonous tetra-ethyl lead, without being nearly as poisonous. Unfortunately, if this "motyl" is used in engines the valves are quickly incrustated, so one cannot predict any particular future for this interesting preparation.

A similar line of investigation as that of the "Badische" has been followed by Privy Counsellor Fischer of the Institute for Coal Research in Muhlheim, and his associate, Dr. Tropsch. They pass purified water gas at 100-150 atmospheres pressure and 710 deg. F. over an alkalized iron catalyst and so derive motor fuel mixtures which they call synthol and synthine. These consist of indefinable mixtures of all possible alcohols and ketones, which, however, can be used to advantage as motor fuels.

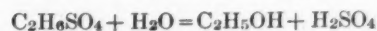
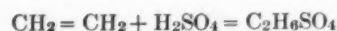
Reconstruction of a Chemical Structure

The reconstruction of a chemical raw material structure can be illustrated to best advantage by the production of tetraline and decaline from naphthalene, which is being carried out on a large scale by the Tetraline Works in Rodleben, near Dessau, since the latter part of the war. Here should be mentioned the names Sabatier, Schroeter, Schraut and Friesenhahn. The solid naphthalene produced from coal is first chemically purified, and is then treated with hydrogen under pressure and at a relatively high temperature in the presence of a nickel catalyst. It then takes up either four or ten atoms of hydrogen and the naphthalene of the chemical formula C_{10}H_8 is converted into the liquid tetraline ($\text{C}_{10}\text{H}_{12}$) or decaline ($\text{C}_{10}\text{H}_{18}$). It is known that both these products have been used and are being used as motor fuel components.

A similar hydrogenation was carried out by Franz Fischer and Schrader, who passed the acid oils of low temperature tar through tinned iron pipes and so converted them in part into benzol—



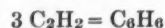
Another "reconstruction" is represented by the production of ethyl alcohol from the ethylenes of coke oven gas with the aid of sulphuric acid—a process which has been known for a long time but which is said to have been put on a practical basis at a coal mine in France recently:



In a very similar way there is recovered in the United

States from the unsaturated higher hydro-carbons of the natural gases, petrohol, an isopropylic alcohol. Mention should also be made of the production of ethyl alcohol by way of carbide, acetylene and acetaldehyde, by the Swiss chemical works at Lonza.

But what comes nearer to our object is the formation of benzol from acetylene when the latter is passed through red hot pipes or over absorption carbon (Zelinsky):



Of course, this process for the synthetic production of benzol is too expensive. But it shows—what automotive engineers already know from its anti-detonating qualities and its ignition temperature as determined by Krupp—that benzol is a particularly temperature-stable motor fuel. And this fact establishes a good prospect for synthetic benzol.

All those mentioned so far are minor chemical reconstructions. A radical course was followed by Bergius, whose work—which has been epitomized by the phrase "the liquefaction of coal"—has stirred the interested industries for a decade. What is involved is that coal, tar and oil at about 840 deg. F. and under several hundred atmospheres pressure combine chemically with gaseous hydrogen and thus change in part to oils. The process suffers from the technical difficulties which are inherent in the control of such temperatures and pressures. But now it is said to have been rendered practical.

In Upper Silesia a large plant is being built for the treatment of Silesian powdered coal, to which the Prussian

State is contributing 1,250,000 marks. The process has the advantage that it requires no catalysts and therefore can be applied to unpurified raw materials (catalysts are "poisoned," that is, rendered ineffective, by traces of impurities).

Besides hydrogen, there are other substances which lead to products similar to those obtained by the Bergius process. Thus, the Frenchman Berthelot, many years ago, successfully carried out the hydrogenation of coal with hydriodic acid and recently Franz Fischer and Schrader with sodium hydride.

If we now review what has been said in the foregoing, we can draw the following conclusions:

The basis of the quality heat unit has been completely undermined by the chemist. It is as yet impossible to say whether the line of attack which is defined by the initials BASF or that associated with the name of Bergius will lead to commercial success, whether both, or a combination or an entirely different one. But there appear no longer any insuperable difficulties, and one must marvel at the variety of the possible roads to success. There is no longer an "if" in the proposition, the question today being, "How can we do it to best advantage?"

As far as can be foreseen, the motor fuel situation probably will work out as follows: Natural and synthetic quality heat units for passenger cars and the majority of motor trucks; special provisions (heavy oil carburetors, hot bulb engines and Diesel engines) for the use of cheap heat units (gas-oil, etc.) in stationary engines and motor trucks operating under specially favorable conditions.

An Improvement in Starter Control Mechanism

GUIDO FORNACA, chief engineer of Fiat, Turin, Italy, has taken out a patent (British patent No. 240,682, Dec. 19, 1924) on a system for starting internal combustion engines, which is a development of the Rushmore system in which the armature of the starter is moved axially and its pinion is enmeshed with the flywheel gear by electro-magnetic means.

Referring to the accompanying illustration, when the double-pole switch *A* is closed, current from the battery *B* flows through the circuit *C*, through the generator *D* and the solenoid *E*, and to the circuit *F*. The solenoid will thus be excited and attract its core *G*, overcoming the resistance of spring *H* and moving shaft *I* and pinion *J* toward the toothed ring *K*.

Starter *L* is supplied with a small current from circuit *F* and starts rotating slowly, the current being limited by resistance *M*. If the teeth of pinion *J* and toothed ring *K* happen to be in juxtaposition, they will mesh immediately, whereupon the toothed ring is rotated and the bridge *N* bears down upon the contacts *O, O*, connecting the starter directly across the battery through circuit *P*, so that it receives a large current.

As the speed of rotation of toothed ring *K* increases, the generator begins to generate an electromotive force in opposition to that of the battery, the effect of which is to weaken solenoid *E*. By the time the engine has been started, the speed and voltage of the generator are sufficient to close the cutout *R*. When this happens the portion *ST* of the line is practically short-circuited, owing to the very low resistance of the series coil, whereas the portion *TU* possesses considerable resistance, owing to the presence of coil *E*. Only a very small current therefore flows through coil *E*, and the solenoid is weakened to the extent that spring *H* returns core *G* to its original posi-

tion, thereby disengaging the pinion from the toothed ring and at the same time breaking the starter circuit at switch *N*.

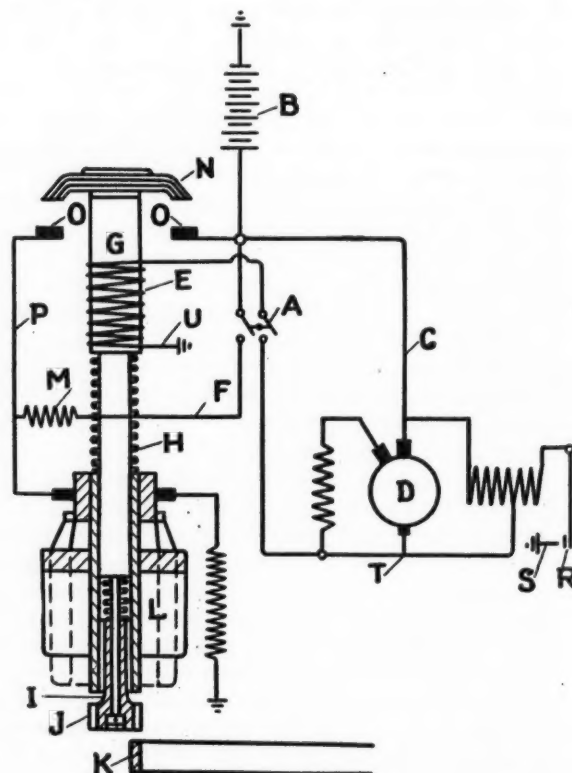


Diagram of Fornaca starting system

Methods of Hardening Camshafts Are Standardized

*American Society of Steel Treathers issues recommended
practice intended to give best results in surface
hardness, penetration and uniformity.*

A RECOMMENDED practice for the carburizing and heat treating of camshafts has been adopted by the American Society of Steel Treathers. The practice applies to all of the steels whose compositions are given in the following table:

Table 1

Steels	Chemical Composition				
	C	Mn.	P. Max.	S. Max.	Ni.
S. A. E. 1015	0.10-0.20	0.30-0.60	0.045	0.050
S. A. E. 1020*	0.15-0.25	0.30-0.60	0.045	0.050
S. A. E. 2320	0.15-0.25	0.50-0.80	0.040	0.045	3.25-3.75
½% Ni	0.10-0.20	0.30-0.60	0.045	0.050	0.50-0.75
S. A. E. 2512†	0.17 Max	0.30-0.60	0.040	0.045	4.50-5.25
S. A. E. 3120	0.15-0.25	0.30-0.60	0.040	0.045	1.00-1.50
Ni-Mo‡	0.10-0.20	0.30-0.50	0.040	0.045	1.25-1.75
S. A. E. 6120§	0.15-0.25	0.50-0.80	0.040	0.040
Cr-V*	0.10-0.15¶	0.30-0.50	0.040	0.040

*These steels are the ones most commonly used for camshafts.
†The chromium content for this steel is 0.45 to 0.75 per cent.
‡The molybdenum content for this steel is 0.20 to 0.30 per cent.
§The chromium content for this steel is 0.80 to 1.10 per cent and the vanadium content is 0.15 to 0.20 per cent.
¶The chromium content for this steel is 0.25 to 0.40 per cent and the vanadium content is 0.15 to 0.20 per cent.

For annealing, S. A. E. steels Nos. 1015, 1020, 2320, 3120 and 6120, and the 0.50 per cent nickel, nickel-molybdenum, and chrome-vanadium steels are placed in the furnace so as to expose the maximum surface area. They are heated slowly and uniformly to a temperature of 1600-1650 deg. F., and cooled at a rate to give the desired machinability. The 5 per cent nickel steel (S. A. E. No. 2512) also is placed in the furnace so as to expose the maximum surface area, and is heated slowly and uniformly to 1600 deg., at which temperature it is held for about one hour. It is then cooled slowly in the furnace to 800 deg. F., and then cooled in air.

Quenched and Tempered

Hollow camshafts are quenched and tempered, at the proper temperatures, before machining, to obtain the desired machinability. One or the other of two methods may be used to obtain a camshaft that can be straightened without breaking after hardening. One consists in copper-plating the entire shaft before carburizing and removing the copper by grinding or turning from those areas which are to be carburized and hardened. The second method consists in forging or machining the camshafts somewhat larger, with an excess of metal between the cams and bearings. This excess metal is machined off after carburizing and before hardening.

The carburizing operation should be carried out in containers and furnaces of suitable dimensions and design to permit uniform heating throughout the charge. The carburizing temperatures for the various steels are given in Table II.

The camshafts should be so packed that the areas to be hardened do not come in contact with each other or with the walls of the containers. Sufficient compound should be used so that the camshafts are not exposed at

any time during the carburizing and cooling operations; after carburizing the camshafts are allowed to cool in the containers.

The time required to attain the depth of case depends upon a number of factors, such as temperature of the furnace at the time of loading, rate of heating, type of furnace, thickness of the containers, amount of stock left for grinding, etc. However, the carburizing time and the amount of stock left before grinding should be so regulated that the depth of case after grinding is at least 0.045 inch. The hardness of the camshaft should not be below a scleroscope reading of 75.

Avoid Decarburization

The camshafts should be heated uniformly to the temperature given in Table II, and held for complete penetration of heat. The heating medium should be of such a character that no decarburization will take place.

To prevent warpage, the shafts should be arranged properly in the heating medium and quenched either vertically or rolled horizontally into the quenching bath.

After quenching, reheat the camshafts in a suitable tempering medium to the temperature given in Table II, and hold at this temperature for at least one hour, to insure complete penetration of heat. The highest temperature that will not affect the hardness should be used.

Table 2

Carburizing and Heat Treatments for Camshafts					
Steels	Carburizing Temp. Deg. F.	Cool in	Reheat to Deg. F.	Quench in	Tempering Temp. Deg. F.
S. A. E. 1015	1625-1750 box	1425-1450*	water or brine	350-400	
S. A. E. 1020	1625-1750 box	1425-1450*	water or brine	350-400	
½% Ni	1650-1700 box	1375-1425*	water or oil	250-450	
S. A. E. 2320	1575-1625 box	1325-1375*	oil	250-450	
S. A. E. 3120	1625-1675 box	1375-1425*	water or oil	250-450	
S. A. E. 2512†	1600-1650 box	1350-1400*	oil	250-450	
Ni-Mo	1650-.... box	1475-1525	oil	350-....	
S. A. E. 6120	1675-1725 box	1425-1475*	water or brine	400-450	
Cr-V	1675-1725 box	1425-1475*	water or brine	400-450	

*Use lowest possible temperature to produce maximum hardness.
†After rough machining, anneal at 1450 degrees Fahr., air cool, finish the machining and then carburize.

The mixture of the carburizing compound is left to the judgment of the individual. Some add only enough new compound to replace the amount used during carburizing, while others vary the ratio from the above to a mixture of 50 per cent old and 50 per cent new.

Several methods are used for packing the camshafts. For example, a single shaft may be packed in a tube, or a number of shafts may be packed in a tube or box of suitable size.

With plain carbon steel (S. A. E. 1020), satisfactory results may be obtained without annealing or other treatment before machining, although the above practice puts the steel in a better condition.

When using a salt bath as a heating medium for hardening, the shafts are sometimes preheated to approximately 600 deg. F., transferred to the salt bath, in which they are suspended vertically to prevent warping, and maintained in the heating medium until they attain the proper hardening temperature. They are then quenched and tempered.

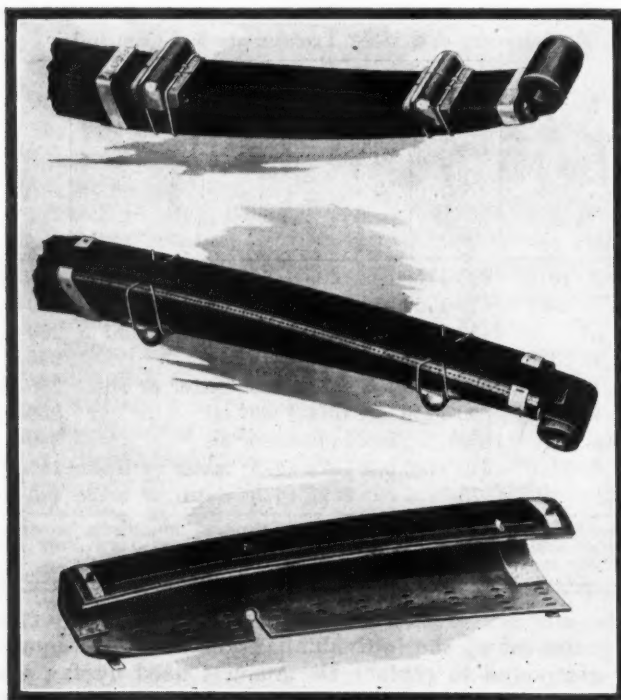
Alemite Spring Protector

THE Bassick Mfg Co. has gone into production on a new type of cover for springs, known as the Alemite spring protector. The protector is secured by means of a patented locking device consisting of metal lugs or ears that fit into corresponding slots or eyes.

The ears are attached to a strip of metal built into the fabric on the under side and extending the entire length of each section. The two edges of the fabric overlap and, when the protector is applied, these ears are inserted in corresponding notches or eyes in the opposite edge. Thus inserted, the ears can be clamped to effect a tightly sealed, flush metal joint.

At the end of each section of fabric is a heavy notched aluminum strip which serves as a reinforcing end band to keep the end of the spring free from water and dirt. This band likewise is fastened by means of an ear which bends over to secure the protector tightly to the spring. A strip of felt padding attached to each end of the fabric acts as a mat, and together with the reinforcing end band helps to effect a water-tight and dirt-proof joint.

With either section of the Alemite spring protector is provided a three-piece, metal spring clip cap of nickel-plated brass, adjustable to different sizes of spring clips. It can be installed to fit snugly over the spring clips,



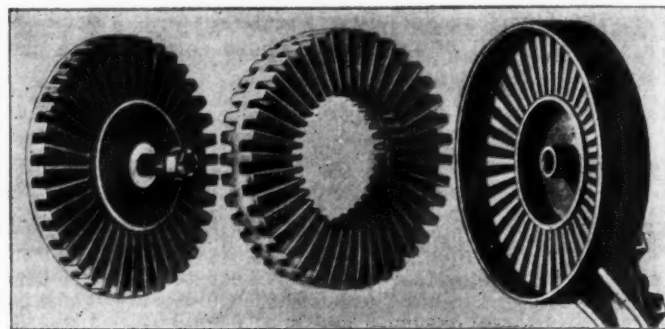
Alemite spring protector on and off the spring

eliminating the possibility of water and dirt getting into the spring at this joint. Two enameled copper wires are bent around the protector after the clip cap is applied.

A 1/8-inch pipe thread plug is screwed into an opening in the upper surface of the fabric and provides a convenient means of lubricating the spring if lubrication is desired.

Springless Suspension System

A VEHICLE suspension system making use of the flexibility of rubber has been developed by the Adams Springless Suspension Corp. of New Haven, Conn. In appearance the device is not unlike the conventional disk type of shock absorber, with a fixed member secured to the chassis frame and a rotatably movable member therein



The Adams Springless suspension

which carries an arm whose free end is linked to the axle. But whereas in the shock absorber rotation of the movable relative to the stationary member is opposed by the friction between two sets of disks, pressed together by a spring, in the Adams system it is opposed by the resistance to deformation of a rubber member inserted between two metallic members.

As may be seen from the illustration herewith, the device consists essentially of two metal disks, each formed with radial teeth on one side, and of a rubber disk formed with corresponding teeth on opposite sides, interposed between the two metal disks, the teeth on the rubber member entering the spaces between teeth on the metal disks. The inner of the two disks is securely bolted to the chassis frame, while the outer one is combined with a housing and with means for fastening to it a lever arm which can be connected to the rear axle. A central stud of alloy steel, with castellated nut, holds the assembly together and compresses the rubber teeth in the tooth spaces of the metal disks. The flexibility of the rubber in the disk allows the chassis frame to approach the axle when the latter hits an obstacle, and restores the normal relation between frame and axle after the obstacle has been passed.

Among the advantages claimed for this rubber spring over the conventional steel springs are the following: No lubrication is necessary; no spring covers are required and there are no bushings to be replaced. The device does not squeak like leaf springs when dry. No radius rods are required, nor any auxiliary suspension devices, such as snubbers, air springs, etc. The tire mileage is improved and the springs are guaranteed for the life of the car.

CLARKSON Steam Motors, of London, England, which some years ago developed a thimble tube type of steam boiler for trucks and omnibuses, is now making these boilers for use on motor ships to be operated by the exhaust gases from the engines.

EDITORIAL

Sane Optimism

IN the midst of Mr. Hoover's interesting talk about rubber and the wise cracks of the humorist of the evening at the banquet of the National Automobile Chamber of Commerce, it is possible that one rather significant remark of the toastmaster's did not register as clearly as it might have under other circumstances.

"This year," Roy D. Chapin said, "we will be satisfied to equal the successful year of 1925, but we are going to make 1926 better if possible." The conservation and wisdom of that statement, coming as it does from a man of great prominence in the industry, is reassuring in its temperateness as well as in its optimism. It indicates that the industry will go ahead with vigor and with confidence but that inventories and plant capacities will not be built up on the assumption that a huge increase in output is a certainty.

Putting together statements by individual factory heads as regards production schedules for the current year, it would appear as though the industry were planning to build some 40 per cent more vehicles in 1926 than in 1925. Despite these statements regarding individual organizations, however, no such increase for the industry as a whole is expected by any executive. Coming on top of a multitude of show week production predictions, Mr. Chapin's statement would seem an excellent basis of operation for the industry this year.

Danger in Reprisals

ONE aspect of the fight to defeat the ends of the British rubber monopoly and to bring down rubber prices should be kept clearly in mind throughout whatever events may follow in the next year—attempts at reprisals on the part of the United States, Mr. Hoover says, are likely to result in just the troubles which we fear from the foreign monopolies. Hoover's reasoning has been something like this:

Governmental activity in ordinary commercial matters tends to bring such questions into the realm of international politics, thus endangering friendly relations between nations and international peace.

Hence governments should stay out of such activities.

But several foreign governments have gone into them directly or indirectly. Consequently the United States must protect itself by taking whatever temporary steps are possible and by assuring itself of a reasonable supply of raw materials from competitive sources.

Plans advanced to meet a trade war should be discarded. Reprisals would mean that the United States would be doing the thing for which it is criticising foreign governments—even though our action might be in self-defense.

It is worth while to follow through Mr. Hoover's reasoning carefully and to see clearly the logic of his

presentation, because of the danger that his original conception of how a difficult situation may be met practically and at the same time sensibly and peacefully stands some chance of getting lost in the mazes of future Congressional debate and political oratory.

Dealers and Factory Policies

DEALERS on the Board of Directors! The announcement that such a move would be incorporated in the policy of a company so large as Dodge Bros., Inc., sometime in the near future has set automotive tongues wagging and luncheon table argument going.

The growing influence of the dealer on policies of factories and the need for stabilization of the retail organization through the shaping of factory plans in such a way as to make possible efficient retail operation have been recognized for several years now. Merchandising actions of many manufacturers in recent years have borne witness to the increased power of dealer opinion in determining policies in the industry. But thus far dealer influence usually has been indirect and unofficial.

The proposal made by Clarence Dillon for incorporation into Dodge Bros., Inc., of such a policy would move this dealer influence from the realm of the informal to the realm of the official. The result would be to strengthen the influence. Thus far the sway exerted by the retail side of the business has been largely toward stabilization of conditions; consequently extension would seem likely to have favorable results. Mr. Dillon's suggestion is important enough to bear careful study from other companies.

The Price Situation

NOTHING sensational in the way of price changes developed during the week at the New York Show. There were numerous revisions but none of them radical enough to excite the industry or the public. Taking the changes as a whole, no marked trend up or down could be discerned; some manufacturers slashed and others raised. There were more reductions than increases, but enough of the latter to make it certain that there is nothing panicky about the attitude of the industry toward prices. Where a manufacturer deemed price increases justified he apparently made them without hesitation.

All in all, there seemed to be a feeling among automotive executives that prices had been pretty well stabilized for the present. There always will be fluctuations but none of a radical character is expected just now. Higher material costs, especially rubber, constitute one very important restraining element.

AUTOMOTIVE **NEWS SECTION** INDUSTRIES

Philadelphia, Pennsylvania

Thursday, January 21, 1926

Retailers in Good Shape—Spring May See Car Price Increases

PHILADELPHIA, Jan. 21—While the New York Annual Automobile Show failed to reveal any clear-cut trend in prices, the reductions were more general than the increases, an indication of the strongly competitive condition of the industry at the present time. On the basis of cost factors alone, there would appear to be more reason for raising prices than for lowering them. It is not without the bounds of possibility that more or less general increases will be made when the spring demand for new cars begins to be strongly felt.

At present rates of production and sales, dealers' stocks are being increased slightly, but on the whole the retailers are in fairly good shape. The extent to which production has been kept down during the last few weeks has been a source of considerable satisfaction, as it was widely feared that as a result of the plant expansion programs recently completed by most of the large manufacturing companies, the temptation to crowd dealers in the slack selling season would be too great.

Financing Arrangements Help

One factor that is helping the dealers to carry cars without financial embarrassment is that most of the large producing companies now have arrangements with financing companies whereby the retailers are able to borrow on cars in stock at low rates of interest and for a large part of the total cost to them. Stocks are a merchandising advantage if disposed of within a reasonable time, it is generally recognized.

The new cars introduced at the show, and the price changes made at that time, indicated that probably the fiercest competition of the 1926 season would be waged among producers and distributors of sixes. A large market for these vehicles is looked for, with even the farmers a factor of considerable importance in the sale of the small sixes, and the manufacturing companies are all eager to get a heavy slice of the business.

New Cadillac Unit Ready to Operate on Feb. 1

DETROIT, MICH., Jan. 19—The new assembly building, the largest unit in the expansion program of the Cadillac Motor Car Co., will be finished Feb. 1, it is announced. Installation of new equipment will begin immediately thereafter.

The unit will provide means for more orderly arrangement of final assembly operations, all carried out under daylight conditions, and also provide space for storage of finished chassis and finished cars prior to shipment.

Collapse in Rubber Result of Campaign

Drive on Gouge Brings Price of Spot Crude Down to 75 Cents

NEW YORK, Jan. 19—A collapsing rubber market this week was striking evidence of the initial success of the drive against the British monopoly started by Secretary of Commerce Hoover and taken up in vigorous fashion by the automobile and tire industries. A 10 cent drop in spot crude on Monday brought the price down to 75 cents, against a recent high of \$1.10, and there was prospect of a further decline.

As a consequence, Mr. Hoover told Congress that there was no need for direct Government loans to the private American interests engaged in the fight.

Release of speculative holdings was given as the immediate cause of the drastic decline. Holders of the crude became alarmed at the measures undertaken here and threw their stocks on the market. But there was a decline of 7,000 tons in rubber consumption in the United States in December.

Meanwhile, projects started by members of the National Automobile Chamber of Commerce and the Rubber Association of America, Inc., are being advanced as rapidly as possible. The rubber men are working on plans for plantation development on a large scale, while the car and truck manufacturers propose the formation of a corporation with somewhat wider objectives—to produce, purchase and deal in raw rubber. The corporation would also have the right to manufacture tires.

Commerce Dept. Reports 1925 Output 4,314,636

WASHINGTON, Jan. 21—Automobile production in the United States during 1925 totalled 4,314,636 passenger cars and trucks, compared with production in 1924 of 3,640,108, or an increase of 674,-

DODGE DIRECTORS ELECT OFFICIALS

DETROIT, Jan. 21—Joseph B. Graham was elected vice-president in charge of manufacturing, and A. Z. Mitchell vice-president in charge of purchases at a meeting of the board of directors of Dodge Bros., Inc., yesterday.

Mr. Graham is president of Graham Bros., manufacturer of trucks.

528 passenger cars and trucks during the past year, it is announced today by the U. S. Department of Commerce.

The December production of motor vehicles was 285,198 passenger cars and 34,270 trucks, of which 277,700 passenger cars and 32,542 trucks were made in the United States, and 7,498 passenger cars and 1,728 trucks were produced in Canada.

Coolidge Issues Call to Safety Meeting

Asks Governors to Send Delegates to Conference on Traffic Measures

WASHINGTON, Jan. 21—Invitations to all state governors to participate in a nation-wide campaign against the increasing automobile deaths throughout the country have been sent out by President Coolidge. Such deaths last year totaled 24,000, and injuries arising from accidents numbered 500,000.

The conference will be held here March 23-25 under the direction of Secretary of Commerce Hoover, who is general chairman of the national conference on street and highway safety.

The President's letter of invitation to the governors, is as follows:

"I scarcely need refer to the importance of the subject at issue. Nearly 24,000 of our citizens were killed and probably 500,000 hurt by street and highway accidents during the past year. Therefore, constructive exchange of opinion, development of traffic control and safeguards become of the highest importance.

"The control of highways is, of course, a matter for the states and not for the National Government, but it is my feeling that conferences of this character between state officials and various voluntary associations interested in the problem result in valuable contributions to the progressive solution of what is a very difficult question."

Trend Toward Lighter Motorcycles at Show

Latest Designs at New York Exhibition—Trade Meetings Held

NEW YORK, Jan. 20—The twelfth annual motorcycle and bicycle show, held by the Cycle Trades of America at the new Madison Square Garden this week, marks the 25th anniversary of the first motorcycle show, held here at the old Garden.

The various exhibits and the business meetings of the Bicycle Manufacturers Association, the Cycle Trades and Accessories Association, the Cycle Jobbers Association of America and the Motorcycle and Allied Trades Association emphasized the fact that the tendency of the motorcycle industry is toward the development of lighter-weight machines, while the bicycle industry is bearing toward development of markets outside congested centers.

Lighter Motorcycles Sought

The trend toward lighter-weight motorcycles, which began two years ago, is marked in the exhibits this year. The first motorcycles were motorized bicycles and in their development weight was added to such an extent that many prospects were afraid to run them. The increasing trend toward lighter models is regarded as furnishing an initial market leading to increased popularity for the heavier machines.

In the bicycle field there are four times as many cities in this country which have no dealers as there are cities which have dealers. The trade now realizes the futility of waiting for congested traffic solutions for enhancing the bicycle's popularity in the larger cities. Instead the trade is turning towards the 75 per cent of the American market where there are no dealers now and where bicycle popularity is not discounted by congested traffic.

Novel Exhibits

Among the new things at the show are motorcycle taxicabs, new varieties of scooters, improved bicyclettes and a collapsible home trainer imported by the Terminal Cycle Co. and designed as a means of teaching bicycle riding in the living room or attic.

Among the exhibitors also identified with the automotive trade are the Robert Bosch Magneto Co., Inc., Champion Spark Plug Co., Indiana Rubber & Insulated Wire Co., New Departure Mfg. Co., Stewart-Warner Speedometer Corp., Splittorf Electrical Co., Wheeler-Schebler Carburetor Co. and Zenith-Detroit Corp.

The show committee consists of Arthur Davidson, chairman, Frank J. Weschler, D. H. Wetzel, Frank Schwinn, H. G. Alexander and A. B. Coffman, manager.

The meeting of Division C members of the M. & A. T. A. last Wednesday discussed trade-in allowances, flat rate system vs. time charges for repairs, dealer co-operation in club activities, the dealer's attitude toward competition and a clearing house for stolen machines.

333 Gas-Electric Buses for N. J. Public Service

JERSEY CITY, Jan. 19—The Public Service Transportation Co., after a careful investigation by its officials of present installations, is obtaining 333 gas-electric buses for service in Jersey City, Newark and other New Jersey municipalities. These buses will all be of the 33-passenger, single-deck type, and will replace buses having the usual mechanical transmission.

The Yellow Coach Mfg. Co. will deliver 200 completed buses, and will supply the chassis and assemble the engines, generators and driving motors of the remaining 133 units, the bodies for which will be built in the Newark shops of the transportation company by the company itself.

J. D. Dodge Intends to Appeal Decision

DETROIT, Jan. 20—John Duval Dodge was granted a one-fifth interest in the real estate of his half-sister, Anna Margaret Dodge, but was denied any share in her real property by Probate Judge Henry S. Hulbert in a decision handed down yesterday. Anna Margaret Dodge's real estate is assessed at only \$6,384.87, so Dodge's share will be \$1,276.97, whereas her personal property is declared in the inventory to be worth \$7,552,129.52. Dodge's counsel will appeal to the Circuit Court.

Standardization of Wires and Metal Sheets Sought

NEW YORK, Jan. 20—The American Engineering Standards Committee has been requested by the Society of Automotive Engineers to take up the investigation of wire and sheet metal gage systems in order to arrive at a National standard system of designating the dimensions of metal wires and the thicknesses of metal sheets.

Beegle Made Sales Engineer

CLEVELAND, Jan. 21—The Cleveland Varnish Co. announced recently the appointment of Dr. F. M. Beegle in the capacity of sales engineer and general consultant to the manufacturing department. Dr. Beegle was formerly research chemist with Dodge Bros., Inc.

Dr. Beegle was graduated from Pennsylvania State College in 1912, and later obtained the degree of Ph.D. in chemistry from Columbia University, New York City. He conducted research work for the U. S. Bureau of Aircraft Production in 1918, and was chief chemist for the American Chemical & Mfg. Co.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

NEW YORK, Jan. 21—The effects of the seasonal curtailment in industrial operations and in wholesale purchasing are still apparent in some lines, but are gradually disappearing. Retail trade last week was apparently smaller than in the early part of the month, but was more active than a year ago. The movement of general commodity prices was moderately downward.

RETAIL STORE SALES

Sales of the two leading mail-order houses last month amounted to \$53,310,667, or \$8,700,000 more than in November, and \$7,000,000 more than in December, 1924. The year's total was 15 per cent larger than that for the preceding year. Sales of the leading chain stores exceeded the 1924 total by 14.8 per cent.

BUILDING CONTRACTS

Building contracts awarded last month in 36 States, according to the F. W. Dodge Corp., had a total value of \$510,868,400, by far the largest December total on record. This figure is 10 per cent larger than that for the preceding month and 56 per cent above that for December, 1924. The year's total was \$5,821,068,400, or 30 per cent larger than the previous record established a year earlier.

BANK DEBITS

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended Jan. 13 were 9.8 per cent below the total for the preceding week, but 10.1 per cent above that of a year ago.

FISHER'S INDEX

Fisher's index of wholesale commodity prices stood at 158.7 last week, as against 159.3 in the preceding week and 157.6 four weeks earlier.

FEDERAL RESERVE STATEMENT

Bills and securities held by the Federal Reserve banks declined \$106,300,000 during the week ended Jan. 13, with decreases of \$87,700,000 in discounts, \$17,400,000 in open market purchases and \$600,000 in Government securities. Note circulation declined \$44,300,000 and deposits \$4,200,000, while reserves increased \$67,800,000. The reserve ratio rose from 70.2 to 72.7 per cent.

MEMBER BANKS' STATEMENT

Loans of reporting member banks declined \$55,000,000 during the week ended Jan. 6, with a decrease of \$72,000,000 in loans secured by stocks and bonds partially offset by increases in other classes of loans.

MONEY

Call loan rates ranged from 4 to 4½ per cent last week, as against 4 to 6 per cent a week earlier. Time loan and commercial paper rates were unchanged at 4½ to 4¾ per cent and 4¼ to 4½ per cent, respectively.

Schwab Advocates \$5 Steel Price Rise

1925 Statistics Show Increase in Automotive Consumption, Following Competition

NEW YORK, Jan. 21—C. M. Schwab, sailing for a trip abroad, stated that steel should sell \$5 a ton higher than it does now. He added that he thought the price would go up to that extent in the near future.

Mr. Schwab's off-hand remark has been magnified into a formal declaration and prophecy, and if iteration and reiteration of what Mr. Schwab said can lift prevailing price levels, they certainly will advance. Shapes could advance \$5 a ton and be still somewhat below the parity of other steel descriptions.

No Sharp Increase Likely

In a way, the \$5 limit for the rise in price set by Bethlehem's chairman is reassuring to steel consumers. It is a far more modest price bulge than ever happens when steel market conditions are at all ripe for an advance. So far, however, there is no indication of so sharp an increase in demand that price advances could be sustained. This condition, it is true, may change overnight, but early this week a decided tone of easiness was in evidence. In fact, black sheets, it was rumored, were coming in for considerable price shading.

There was some doubt as to whether or not the \$1 advance in the price of sheet bars was being uniformly adhered to, and some interests were quoting \$37.

The feature of all 1925 statistical compilations was that they showed a much increased steel consumption by the automotive industries. Of this sales managers are keenly aware, as they are also of the intensive price competition among motor passenger car and truck manufacturers. There are those who consider the present a very inopportune time for making even slightly higher steel prices palatable.

The Metal Markets

Pig Iron—The market continues rather dull. Higher coke prices further complicate the position of the smaller blast furnaces. The price situation is awry. There are rumors of some sellers asking 50 cents more, and of others making concessions of 50 cents per ton.

Aluminum—Quite a little new automotive business has been placed in the last few days. The market is of a routine character at the pegged price which is uniformly adhered to by the importers as well. Remelted metal is in good demand and rather light supply.

Copper—Domestic consumption is at a good rate, and, in response to it, production is at a correspondingly good rate. Connecticut Valley mills have fair orders for automotive brasses, etc.

Tin—Because of their heavy require-

G. M. EXPORTS TOTAL REACHED 102,562 IN 1925

NEW YORK, Jan. 21—In 1925, it is estimated that General Motors exports numbered 102,562 cars and trucks, valued at \$78,479,381, compared with 64,626, valued at \$50,797,418 in 1924.

James D. Mooney, in charge of General Motors exports, believes that 1926 will see an export volume of \$100,000,000, which was the goal set three years ago for 1928.

ments, American consumers are apparently compelled to support the market in spite of high prices.

Lead—Good demand from storage battery consumers continues to feature the firm market.

Zinc—A shade easier. An international authority predicts wide price fluctuations this year.

1,500,000th Dodge Automobile Built

DETROIT, Jan. 20—Dodge Brothers' 1,500,000th motor car has been built. It was completed here last week, eleven years and two months after the first car bearing the Dodge name rolled from the assembly line as a finished product.

Car 1,500,000 is a special touring car and was shipped to Los Angeles for service with other Dodge machines as one of the "scout cars" there. They are in service, laying out and re-checking tourist records, in addition to investigating road conditions for newspapers and automobile clubs.

The first Dodge passenger car was built November 14, 1914, and delivered to its owner in New York City Dec. 4 of the same year. The 1,000,000th passenger car was completed December 12, 1923.

Velie Reports Progress in Design and Output

NEW YORK, Jan. 18—Velie dealers were entertained by the Velie Motors Corp. at luncheon at the Commodore Hotel last week. Preceding the luncheon there was a brief meeting at which the new Velie engine, introduced at the show, was explained by H. C. Snow, chief engineer of the company.

Edwin McEwen, general manager, announced to the dealers the contest that is being conducted to find a suitable name for the new Velie closed car that was exhibited at the show for the first time. The public is invited to submit names for this car and the one suggesting the name selected by the board of judges will be awarded one of these cars. The contest closes Mar. 31.

At the luncheon, C. W. Hadden, general sales manager, reported progress in the design and production of Velie cars.

1925 Rim Production Shows Steady Gain

Year's Figure 4,134,129 Ahead of 1924—Straight Sides Nearly Double

CLEVELAND, Jan. 18—December rim production figures, just made public by the Tire & Rim Association of America, Inc., show a healthy growth over the corresponding period in 1924. Totals for December, 1925, and December, 1924, were 1,607,559 and 1,213,788, respectively. Totals for the year 1925 and 1924 were 25,997,849 and 21,863,720, respectively. The 1923 figure was 23,141,962.

Figures for principal sizes are given in the subjoined table:

Size	Dec. 1925	Nov. 1925	Year 1925	Year 1924
30 x 3½	314,559	496,973	4,997,398	9,675,744
28 x 3½	625,080	990,160	8,643,472	1,050,904
28 x 4	135,940	148,281	2,946,938	949,671
29 x 4	116,976	129,816	1,639,874	717,284
32 x 4	27,226	26,516	316,147	1,370,681
30 x 4½	79,059	125,328	1,628,419	569,574
30 x 5	32,118	30,570	402,899	155,245
Truck				
30 x 5	41,817	66,307	840,768	146,888
36 x 6	2,045	10,335	75,309	31,934

Comparative figures for clincher and straight side rims inspected, rejected or approved in 1925 and 1924 are as follows:

	1925	1924
Clincher rims inspected	6,656,681	12,755,518
Clincher rims rejected	709,611	1,416,536
Clincher rims approved	5,947,070	11,338,982
Straight side rims approved	20,050,779	10,524,833
Total rims approved	25,997,849	21,863,815

Studebaker 1925 Sales 135,000—Gain of 22.7%

NEW YORK, Jan. 21—Studebaker sales in 1925 were about 135,000, an increase of 22.7 per cent over 1924. Unsold stocks throughout the country are estimated as satisfactory.

Studebaker in 1925 also enjoyed its largest foreign business, with exports of 18,000 cars, showing an increase of 63 per cent over 1924.

December Peerless Sales Show 400% Increase

NEW YORK, Jan. 21—Charles A. Tucker, general sales manager, reports that steady increase in sales of the Peerless Motor Car Corp. through 1925 came to a climax in December, which showed an increase of about 400 per cent over December, 1924.

Diana Brougham Cut \$300

ST. LOUIS, Jan. 21—In addition to the price cuts announced last week in *Automotive Industries* the Moon Motor Car Co. announces a \$300 reduction in the price of the Diana two-door de luxe brougham, which is now priced at \$1795.

Truck Tax Restored Stirs Fresh Fight

Makers, Dealers, Users, Defy
"Penalty on One Branch
of Transportation"

NEW YORK, Jan. 19—The action of the Senate Finance Committee in restoring excise taxes on motor trucks, which the House had deleted, has aroused shippers, users, truck makers and dealers to exert every effort to fight it as a penalty on one branch of transportation.

Members of the National Automobile Chamber of Commerce are calling a special meeting to formulate a definite program against such action, and the issue will be carried to the House and Senate floors.

Further Car Cuts May Result

It is regarded as possible that further reductions will be granted on passenger cars and trucks, now that the Senate Finance Committee has precipitated the issue. Opponents of the committee's action point out that motor trucks pay much higher taxes than passenger cars in many states, and state officers hold that, if commercial vehicles pay still more for the use of highways, then that is revenue which should go to the state, and it should not be seized for Federal purposes.

Among the groups on record as against such Federal taxes are the American Farm Bureau Federation, American Automobile Association, National Automobile Chamber of Commerce, National Automobile Dealers Association, Motor Truck Association of America, Rubber Association of America, Inc., and the Motor and Accessory Manufacturers Association.

Senate Plan Yields \$75,600,000

By the reimposition of the 2 per cent tax on trucks, the new revenue bill provides an increase of approximately \$3,000,000 in automotive taxes over the total amount specified in the measure as passed by the House.

The bill, as reported, carries the same reduction in passenger car taxes as provided for in the House, from 5 per cent to 3 per cent, and repeals the tax on tires, accessories and parts. From a revenue standpoint, the automotive feature of the bill will yield the Government, under the Senate bill, \$69,600,000 from passenger car sales, and \$6,000,000 from truck sales, or a total of \$75,600,000 compared with the total collections under the old revenue act of \$116,000,000, from these sources.

Opposition to the reimposition of the 2 per cent tax on trucks was voiced by Alvan Macauley, president of the Packard Motor Car Co., and H. H. Rice, chairman of the N. A. C. C. tax committee, who went before the Senate Finance Committee and charged that the action of the committee in reimposing

OLDS HAS NEW CAR PURCHASING PLAN

LANSING, Jan. 20—Olds Motor Works has just made available to its dealers a 6 per cent purchase certificate plan similar to that in operation for some time by the Chevrolet Motor Co.

Under the plan, a prospective purchaser gradually accumulates the sum needed to make a first payment or full cash payment on a new car, the dealer paying 6 per cent interest on deposits, with an additional credit of 6 per cent on all service, repairs and accessories bought from the dealer during the time the certificate is in force.

the 2 per cent truck tax was contrary to the agreement made at the time the measure was before the House.

Goodyear Negotiates for Cotton Mills

AKRON, Jan. 19—Officials of the Goodyear Tire & Rubber Co. tonight confirmed a report that the company is negotiating for the purchase of the Essex Cotton Mills in Passaic, N. J. The purchase is in line with the company's policy since reorganization of buying cotton mills, wherever obtainable on favorable terms, to fill fabric requirements for its tire factories.

The Essex mills have a capacity of between 170,000 and 180,000 spindles, covering a large acreage, and the plant is said to be well equipped.

The Goodyear company now operates cotton mills in California, Connecticut and Massachusetts. Practically all fabric requirements of the Los Angeles tire factory are supplied by the California mills.

Acquisition of the New Jersey mills will provide fabric sufficient for 75 per cent of requirements of Goodyear tire factories in Akron and in Canada, according to officials of the company. It is said to be the purpose of the company eventually to be entirely independent of the textile companies.

E. P. Chalfant Honored

NEW YORK, Jan. 19—The Rotary Club of New York recently tendered a farewell dinner to E. P. Chalfant, one of its past presidents, at the Hotel McAlpin and presented him with a bronze desk set.

Mr. Chalfant is chairman of the board of directors of the Gill Mfg. Co., former president of the Motor & Accessory Manufacturers Association, and in November was appointed executive vice-president of the National Standard Parts Association. His new headquarters will be at the association offices in Detroit.

Theft Rates Higher; Liability Cuts Made

Private Insurance Companies'
Rates on Automobiles
Now Effective

NEW YORK, Jan. 18—New rates on automobile fire, theft, liability and property damage insurance, as offered by the private insurance companies, became effective today.

Liability and property damage rates are slightly lower as a whole. Such rates on commercial cars are unchanged in most territories, but in a majority of instances there is a substantial decrease in such rates on garages. These rates on public automobiles continue unchanged, except in one or two sections. The 1926 collision rates are also the same except in a few territories where they have been increased. New passenger car rates on liability insurance range from \$16 to \$25 in New Orleans to \$87 to \$136 in New York City.

Fire rates do not show many important changes, but theft rates show marked increases in some instances, especially on the more popular makes of cars.

Production at American Bus & Truck Co. Begins

SPRINGFIELD, OHIO, Jan. 18—Production of motor buses and commercial trucks started today at the Kelly plant of the American Bus and Truck Co. Gen. C. C. Jamieson, chairman of the board of the new Delaware company, was here the latter part of the week and made preparations to start manufacturing.

The American Bus and Truck Co. recently purchased the property from the Kelly-Springfield Motor Truck Co. at a receiver's sale.

N. Y. Rubber Exchange to Open in Fortnight

NEW YORK, Jan. 19—The Rubber Exchange of New York, Inc., which will open for trading at 31 S. William St. in about a fortnight, has amended its by-laws to increase regular membership to 250 and thus permit the election of additional members whose applications have already been received. In addition, there are five charter members.

Walter Dutton has been made secretary.

Carter Miller Dead

CANTON, OHIO, Jan. 20—Carter Miller, manager of advertising and sales promotion for the Timken Roller Bearing Co., is dead here following an illness of only a few days. Pneumonia caused his death.

Mr. Miller, born in Bay City, Mich., came to the Timken organization six years ago. He was elevated to the post of manager a year ago.

Guggenheim Aids Aeronautics by Gift

Sum of \$2,500,000 as Fund for
Development of Commer-
cial Aircraft

NEW YORK, Jan. 19—Daniel Guggenheim, who last summer gave \$500,000 to establish a school for aeronautics at New York University, announces in a letter to Secretary of Commerce Hoover that he has decided to establish the Daniel Guggenheim fund for the promotion of aeronautics, and to place at its disposal the sum of \$2,500,000.

Trustees named below will incorporate the foundation under New York State laws. At their disposal will be \$500,000 to defray expenses of studies and any immediate work necessary, and the remaining \$2,000,000 will be subject to the developing needs of their work in promoting the aim of the fund. This aim is to cooperate with all branches of the Federal government and the public generally in bringing about such an advance in the art of aeronautics that private enterprise will eventually find it practicable and profitable to carry it on.

Fund Not to be Permanent

Any earnings will be turned back into the fund, and Mr. Guggenheim does not intend that it shall be permanent. The trustees have power to spend the principal sum to promote commercial aviation as one of the most important new agencies of civilization.

Mr. Guggenheim would have the trustees, through a simple, inexpensive organization and depending on outside agencies whenever possible, promote aeronautical education both in institutions and among the general public; assist in the extension of fundamental aeronautical science and the development of commercial aircraft and aircraft equipment; further the application of aircraft in business, industry and other economic and social activities, avoiding work which is properly a Governmental function and restricting attention to civil activities.

"Make Americans 'Air Wise'"

"There is urgent need in our country," says Mr. Guggenheim's letter to Mr. Hoover, "for immediate, practical and substantial assistance to aviation in its commercial, industrial and scientific aspects. No less urgent is the need to awaken the American public, especially our business men, to the advantages and possibilities of commercial aircraft—in a word, to make the American public in a very real sense 'air wise.'"

Mr. Guggenheim believes that establishment of other air schools such as that at New York University may be warranted in the near future and that opportunities for new fields of employment for American young men should be developed in the air.

The following compose the board of

trustees to administer the fund.

Orville Wright, who, with his brother, Wilbur, was the first to fly a heavier-than-air machine; Dwight M. Morrow, of J. P. Morgan & Co., chairman of the President's Aircraft Board; General George W. Goethals, chief engineer of the Panama Canal; Rear Admiral H. I. Cone, U. S. N., retired, former commander of the United States naval aviation forces; Elihu Root; Prof. A. A. Michelson, Nobel Prize winner in physics in 1907; John D. Ryan, director of air service in 1918; Harry F. Guggenheim, son of Daniel Guggenheim, former naval aviator; F. Trubee Davison, naval aviator during the war and Dr. William F. Durand, member of the National Advisory Committee for Aeronautics.

Car & Foundry Plans Making Wire Wheels

TOLEDO, OHIO, Jan. 18—A transaction of interest to the automobile industry has recently been consummated between the American Car & Foundry Co. of New York City and the Dayton Wire Wheel Co. of Dayton, Ohio. These two firms have entered into a cooperative arrangement for the manufacture of the Dayton Steel Spoke Wheel.

This arrangement is of particular significance to car manufacturers, as well as to the replacement trade, in that it will provide unlimited facilities for the production of this new wheel by affording a source of supply at both the Detroit plant of the American Car & Foundry Co. and the plant of the Dayton Wire Wheel Co., Dayton, Ohio. After more than two years spent in experimental and development work, the Dayton Wire Wheel Co. finally perfected and placed the Dayton Steel Spoke Wheel on the market early in 1925.

This recognition of the future of the Dayton Steel Spoke Wheel makes the arrangement timely and of unusual importance to the trade, as well as to car owners.

Intercontinental Rubber to Develop Calif. Areas

NEW YORK, Jan. 18—The establishment of large rubber-producing areas in California is understood to be one of the purposes of the reorganization of the Intercontinental Rubber Co. For 25 years the Intercontinental Co. has been working on the introduction of rubber from the guayule shrub.

The plan is backed by prominent financiers and bankers, the directors including William A. Cotter and Charles H. Sabin, of the Guaranty Trust Co., John Moron, of the Atlas Portland Cement Co., and H. H. Vreeland, associated with the Thomas F. Ryan interests.

Development of an industry comparable to the western beet sugar industry is predicted if the outcome of the large-scale production of the shrub confirms results achieved in experimental work.

Approves Sale of Tetraethyl Lead

Committee Finds That Chem-
ical May be Safely Used
With Proper Precautions

WASHINGTON, Jan. 20—Tetraethyl lead is expected to be again on sale within a short time as the result of a report submitted to Surgeon General Cumming by an independent committee of scientists, which declares that, with proper precautions, the chemical may be safely used. The surgeon general announced that he would call a meeting of state health officials to draft regulations governing the sale and use of the product and that it would be the duty of the state health departments to administer the rules.

Meanwhile, a preliminary set of regulations has been drawn by the surgeon general's office for the guidance of the Ethyl Gasoline Corp. until action is taken by the state officials. These regulations, in substance, provide that blending of the lead with gasoline shall be done in as few places as possible; that the leaded gasoline be colored so as to be readily distinguishable from ordinary fuel, and that signs be placed at all filling stations warning the public that it is for fuel use only.

D. L. Edsall on Committee

The committee, which included Prof. David L. Edsall, dean of the Harvard Medical School, and several other distinguished research chemists and physicians, found that, so far as could be ascertained, all the reported cases of fatalities and serious injuries in connection with the use of tetraethyl lead have occurred in the processes of manufacture or blending. It found further that there was no decisive evidence that either garage workers or motor car drivers had ever been injured by the chemical.

The investigation by the committee was the result of a campaign against use of tetraethyl lead by a New York newspaper. The chemical was withdrawn from sale pending the report by the investigators.

E. W. Webb, president of the Ethyl Gasoline Corp., declared that his company was satisfied with the report of the committee.

New Apex Service Dept.

CHICAGO, Jan. 19—The Apex Smelting Co. has established a new service department, it is announced, with Dr. Robert J. Anderson in charge. The department will be devoted to advancing the science of aluminum.

Dr. Anderson is the author of "The Metallurgy of Aluminum and Aluminum Alloys," published in 1925, and was formerly chief of the non-ferrous metals sections of the U. S. Bureau of Mines, Pittsburgh, Pa.

N. Y. Show Week a Brilliant Success

Sales, Attendance and Public Appeal Rank it High in Trade History

NEW YORK, Jan. 16—New York's twenty-sixth annual automobile show, which closed tonight, wrote another brilliant page in the history of the industry.

In actual show sales, trade attendance, and popular appeal of the cars displayed it will rank among the highest in a quarter of a century of remarkable attainments by the automotive industries.

A substantially prosperous year just closed and a bright outlook for 1926 were responsible for the large floor sales. A profitable business year for factories and dealers generally accounted for the large trade attendance.

The industry came to New York a week ago radiating optimism, and nothing happened during the week to dampen that enthusiasm. The merchandise was all that the factories had claimed for it. Nobody rocked the price-boat—much. There was considerable conjecture concerning the ultimate effects of liberal time sales—but prosperity gives little heed to calamity predictions.

By and large the New York show revealed the industry "in high" and set for a pleasant and prosperous "ride" for several more months, anyway.

N. Y. Business Stimulated

Stimulation of business in the metropolitan area was one of the most remarkable by-products of the national show here. While the show booths of local distributors did a good business and many actual sales were recorded, the crowds attracted to the salesrooms along the "row" and the business done here during the week set a record for New York shows.

Several of the distributors handling cars in which striking changes had been made arranged stripped chassis with lecturers in the windows and salesrooms and attracted thousands of visitors each day of the show. One distributor, with a loud-speaker through the front of the store had a crowd of several hundred continually before his window listening to the lecturer at a stripped chassis within.

Show advertising in the newspapers throughout the week was the heaviest in several years—and what was even more important, it was more effective than in past years in presenting the products, and particularly in stressing the suggestion to visit the displays in the show and in the salesrooms.

While the automobile attracted the lion's share of attention, parts, accessories and shop equipment came in for more prominence than in many years. Equipment manufacturers were particularly pleased with the trade interest displayed during trade-days at the show,

259,898 DODGE AND GRAHAM 1925 TOTAL

DETROIT, Jan. 21—Shipments of Dodge Bros. cars and Graham Bros. trucks in 1925 totaled 259,898, of which 24,116 were trucks and the remainder passenger and commercial cars.

and accessory manufacturers reported satisfactory business at the show and encouraging public interest—especially those presenting devices such as fuel and oil cleaners, shock absorbers and similar items that were incorporated in many of the advanced models of the car makers.

A.A.A. Urges Tire Costs be Decreased

NEW YORK, Jan. 18—The board of directors of the American Automobile Association, meeting at the Hotel Roosevelt last week, voted a campaign "to secure motorists of this country relief from the excessive cost of tires." The board also approved efforts, because of European costs, to join in a worldwide protest against excessive tire costs. The necessity of better use of tires was emphasized, but this, it was said, was not to be taken as any suggestion towards encouraging a buyers' strike.

The board also reiterated its opposition to any compromise on the automobile items of excise taxes and "will continue to urge their complete elimination."

Chrysler Stresses More Courteous Service

NEW YORK, Jan. 19—Efficient and courteous service was stressed as the most important factor in the continued success of an automobile dealer business, by Walter P. Chrysler, speaking at the annual New York show luncheon of the eastern distributing organization of the Chrysler company. He also urged the dealers present to get the best service manager and mechanics available, and to pay them what they were worth.

Mr. Chrysler also stated that the 4-cylinder model would be continued indefinitely, as he believed that there always would be a tremendous market for a car of this type. Other speakers at the luncheon, at which the attendance was approximately 1000, were J. E. Fields, vice-president of the corporation, and T. F. McManus, advertising counsel.

James E. McGregor Dies

NEW YORK, Jan. 19—The death is announced of James E. McGregor, manager of the Philadelphia branch of the Crucible Steel Co. of America. Mr. McGregor had been associated with the company since it was organized and was well known in the industry.

November Tires and Tubes Show Decline

Seasonal Inactivity Also Affects Shipments, While Factory Inventory Gains

NEW YORK, Jan. 20—A slight decline in production of tires and tubes in November, 1925, as compared with the previous month, is revealed by the bulletin of the Rubber Association of America, Inc., which has just been issued. At the same time shipments fell off rather sharply, due to seasonal inactivity, so there was a considerable gain in factory inventory.

Production of high pressure inner tubes was 3,430,209 in November, against 3,653,711 in October and 4,226,841 in November, 1924. Shipments for the three periods were respectively 2,798,821 tubes, 4,227,167, and 4,339,207.

Some 1924 Figures Missing

Ballon tire inner tube production in November was 1,269,137, against 1,305,315 in October. Figures by months are not available for 1924. The corresponding figures for shipments are 1,255,966 and 1,656,446.

Production of high pressure cord pneumatic casings was 1,634,710 in November against 1,832,554 in October and 1,771,805 in November a year ago. The corresponding figures for shipments are respectively 1,299,843 casings, 2,141,424 and 1,990,537.

Balloon casing production in November totalled 1,200,399, compared with 1,200,389 in October. For these also there are no detailed figures of 1924 output. Shipments in November were 1,194,457 and in October, 1,602,880.

Fabric pneumatic casings fell to a new low level of production in November with a total of only 336,895, against 346,163 in October and 977,843 in November of 1924. The corresponding figures for shipments are respectively 259,008 casings, 440,619 and 928,662.

Eaton Spring Corp. Buys American Blower Plant

DETROIT, Jan. 16—Sale of the former home of the American Blower Co. to the Eaton Spring Corp. of Chicago, a subsidiary of Eaton Axle & Spring Co., was revealed here today by the county recorder's office. The price paid for the buildings and land was approximately \$2,228,000.

The land, located between Lynch road, the Detroit Terminal Railway and Grinnell Ave. at French road, has excellent facilities for manufacturing, having good transportation for workers, in addition to adequate means for railroad shipping.

Although it could not be confirmed, it was rumored in local financial circles that the Eaton Spring Corp. was to establish a local plant to facilitate delivery of its business in this area.

J. D. Dodge Exhibits Rotary Valve Engine

To be Incorporated in Car Called "Dodgeson," Soon to be in Production

NEW YORK, Jan. 18—An 8-cylinder automobile engine with rotary valves was exhibited here last week by John Duval Dodge, son of the late John F. Dodge, who was one of the founders of Dodge Bros., Inc. Mr. Dodge has had this engine designed for use as the power plant in a new automobile that he proposes to market under the name of *Dodgeson*.

The new engine was designed by C. E. Wyrick, an automotive engineer of long experience. The valve mechanism is carried in a special detachable head of comparatively small dimensions. The head and block are about 4 inches wide and about the height of the conventional 8-cylinder engine. The valve chamber is just above the domed compression chamber of the cylinders and runs the length of the head. Rectangular inlet and exhaust ports are cast vertically in the domed head to connect with the valve chamber. At 90 degrees either side of these vertical connections are the inlet and exhaust ports diametrically opposite, also of rectangular section, which connect with the inlet and exhaust manifold, respectively.

Valve Mechanism Features

The valve mechanism is a central shaft about two inches in diameter, on which are mounted split expansible cast iron sleeves which have openings registering with openings cut in the shaft. Constant lubrication of the valves is provided for by an oil channel at the top of the head and directly over the valve shaft, feeding oil through a number of pin-holes. The engine has bore and stroke of $2\frac{1}{2} \times 5$ in., with total displacement of 196.34 cu. in., and rated horsepower of 20.

No definite date is given as to when the *Dodgeson* car will be in production, although Mr. Dodge has stated that he is going ahead with his plans just as rapidly as the engineering and development work can be done.

Stuebing and Cowan Truck Companies Merge

HOLYOKE, MASS., Jan. 18—None of the lines now being manufactured here by the Cowan Truck Co. will be discontinued as a result of the merger of this company with the Stuebing Truck Co. of Cincinnati, it is stated by J. R. Harland, secretary and manager, who is now in charge of operations at the Holyoke plant. It is expected that the volume of output here will be increased shortly as a result of taking over unfilled orders from the Cincinnati plant. This will mean increasing the operating force at the Holyoke plant, it is thought.

The Holyoke plant will be a supply base for much of the eastern trade, while the Cincinnati works will take care of the west, with the Canadian trade handled by the Montreal branch of the Cincinnati company.

The Cowan Co. has manufactured hand-lift and electric trucks, tractors, skids and platforms.

Officers of the new Stuebing-Cowan Co. are: Walter C. Stuebing, president; W. R. Stuebing, vice-president; J. R. Harland, secretary; William H. Mitchell, treasurer; all of Cincinnati. J. L. Wyckoff and E. N. White, of White & Wyckoff Mfg. Co., which controlled the Cowan truck, have a substantial interest in the new company and a place on the board of directors.

Olds Plans Doubling of 1925 Car Sales

NEW YORK, Jan. 19—Doubling of 1925 sales is the aim of Olds Motor Works officials as outlined at the meeting and dinner of the Eastern Dealers' Association last week here.

More than 450 dealers and sales managers were enthusiastic over the sales promotion, advertising and service plans as outlined. Statistics were given showing the percentage of sales in regard to prospects of the four leading cars in Olds class field. Stress was placed on the building of the prospect files of the dealers.

At the dinner, Alfred P. Sloan, Jr., president of General Motors Corp., and other officials spoke on the trend for 1926 business and indicated that sales would, with cooperation between the factory and dealers, increase 100 per cent over last year.

Hinson Co. Produces 1,500 Tire Covers Daily

WATERLOO, IOWA, Jan. 21—The Hinson Mfg. Co. is making 1,500 tire covers daily. While the tire cover is the leading product of the company, seat covers, side curtains, radiator hood curtains, and top covers are also manufactured by the company.

The officers of the Hinson Mfg. Co. are: Clide Hinson, president and treasurer; T. J. Miller, vice-president; Russell DeGon, secretary; Ben Wengard, general superintendent; P. L. Ferguson, manager; E. A. Zilmer, credit manager.

Warner Mfg. Co. to Dissolve

BELOIT, WIS., Jan. 20—The Warner Manufacturing Co. of this city, manufacturer of automobile trailers, has filed papers of dissolution with the register of deeds in Rock County. Eleven hundred shares of stock were in possession of stockholders at the time of dissolution, it was announced. A statement regarding disposition of the company will be made soon by officials, it is expected.

FINANCIAL NOTES

Brockway Motor Truck Corp.—The stockholders of this corporation have voted to approve the increase in authorized common stock from 35,000 shares of no par value, consisting of 25,000 shares of Class "A" and 10,000 shares of Class "B," to 150,000 shares of no par value, all of one class. The action included the approval of the exchange of outstanding Class "A" and "B" stock for stock of one class, share for share, and a 200 per cent stock dividend on both classes of outstanding common, payable in the new stock. Common stock outstanding consists of 25,000 shares of Class "A" and 3,888 shares of Class "B."

Recently, \$100,000 of this company's 7 per cent preferred stock was offered at par by E. G. Childs & Co., Inc., of Syracuse, N. Y., and Glidden, Morris & Co., of New York City. The stock is callable at 110. A statement of the company said that \$200,000 of preferred stock would be issued, making the total issue \$1,200,000.

Fisk Rubber Co.—Dillon, Read & Co., New York, announce the offering of this company's \$10,000,000 5-year $5\frac{1}{2}$ per cent sinking fund gold notes, due Feb. 1, 1931, at 98 $\frac{1}{4}$ and interest, to yield more than 5.90 per cent. Proceeds will be used to provide the company with additional working capital to meet present costs of crude rubber and for other purposes.

In connection with this offering, the company makes public its consolidated balance sheet, including subsidiary companies, as of Oct. 31, 1925. After giving effect to this financing, net tangible assets are more than \$45,000,000. After deducting current liabilities, amounting to \$3,215,000, the company has net current assets of more than \$37,000,000 for the year ended Oct. 31, 1925. Net sales totaled \$75,000,000. Net income, after all charges, available for interest on funded debt and Federal income taxes, was more than \$8,000,000.

Mack Trucks, Inc.—This company will offer to common stockholders of record Jan. 22 the right to subscribe to one share of common for each six shares held at \$100. Last year's sales exceeded \$67,000,000, against \$46,662,622 in 1924. Profits in 1925 will approximate \$9,500,000, an increase of more than 50 per cent over 1924.

Chandler-Cleveland Motors Corp.—Hornblower & Weeks, New York, announce that they have sold 70,000 \$4 convertible preference shares of no par value of this corporation at \$48 a share. Proceeds of the sale are to be used to acquire preferred stock of the Cleveland Automobile Co. and for expansion purposes.

Flint Motor Co.—Stockholders have approved a proposal to issue \$2,500,000 first mortgage bonds to cover real estate, plant and equipment.

The H. H. Franklin Mfg. Co. has declared regular quarterly dividend of 1 $\frac{1}{4}$ per cent, payable Feb. 1 on stock of record Jan. 20.

Grant Tire Co.—A dispatch from Cincinnati states that the directors of this company have declared a dividend of 50 cents a share, payable Feb. 1 to holders of record of Jan. 20.

Vickers, Ltd.—Stockholders have approved the reduction of \$62,000,000 in the capital.

Sees Lower Ton-Mile Transportation Cost

S. A. E., at Annual Dinner,
Hears Fuel Waste is to
be Reduced Greatly

NEW YORK, Jan. 19—Lowering the cost per ton-mile of transportation is the basis of the progress of civilization, Edward S. Jordan told the Society of Automotive Engineers at its annual dinner held last week at the Hotel Astor, New York City. The motor vehicle has been an important factor in making possible cheaper transportation, Mr. Jordan pointed out, and will continue to be an even greater influence in the future.

Charles F. Kettering was toastmaster at the banquet, which was attended by some 1300 members and guests of the S. A. E.

President Litle Speaks

T. J. Litle, Jr., incoming president of the society, in a brief talk said that he looks for marked progress in the next few years in elimination of fuel waste in motor vehicles. One-third of the total heat energy of the fuel burned on the motor vehicle today, he said, is lost through the radiator and one-third through the exhaust. Means of reducing this waste, he believes, will be found soon.

H. L. Horning, retiring president of the society, outlined briefly the activities of the society during the last year and pledged his hearty cooperation to the incoming administration.

Haynes Bondholders Soon to Vote on Incorporation

KOKOMO, Ind., Jan. 19—Holders of \$1,000,000 in bonds of the defunct Haynes Automobile Co. will be asked to vote soon on a plan to incorporate the bondholders for the purpose of liquidating remaining assets of the factory, according to steps outlined by George L. Davis, Kokomo banker and chairman of the bondholders' committee, following a conference with officials of the Fletcher Trust & Savings Bank, of Indianapolis, trustees.

Davis suggests that the present bondholders' committee be dissolved, holding that incorporation would centralize all voting power in the board of directors, and facilitate the sale of the factory buildings here, a thing which is now being attempted.

Battery Makers to Meet on Feb. 5-6 in Chicago

NEW YORK, Jan. 18—The National Battery Manufacturers Association announces that the program for the association convention, to be held February 5-6 at the Sherman Hotel, Chicago, will include discussion of the following subjects:

EMPLOYMENT GOOD IN CAR INDUSTRY

WASHINGTON, Jan. 21—Highly optimistic reports concerning employment conditions in the various automotive centers are contained in the January issue of the Industrial Employment Information Bulletin, just released here by the U. S. Employment Service.

Speaking generally of the situation, the bulletin says: "The automobile industry is maintaining a high rate of production and employment."

Referring to the prevailing employment conditions in Michigan, the following observation is made: "Automobile factories are operating on very high schedules; some plants are temporarily closed, taking inventory."

Chemical control in the battery industry, insurance of batteries against loss and theft, the Luthy process of plate material reclamation, credit bureau (detailed plan), the association idea (A—purpose, B—what are we accomplishing? C—membership), publicity, trade customs and standards of trade practice, a business summary (A—general conditions, B—battery conditions), participation in automobile and radio shows, etc., as an association, and the members as individuals, mail order business and mail order competition, health maintenance in the battery plant, developments in the radio field (A—trickle charge, B—eliminator), outlook for radio batteries, action to curb misrepresented radio batteries, private brand batteries and sales policies (A—protection vs. unlimited sales, B—sale of plates, C—cost of plates, D—cost of materials).

Prepare to Rebuild Ford Experimental Factory

DETROIT, Jan. 18—Preparations were started today by Ford engineers to rebuild the airplane experimental factory at Dearborn, which was completely destroyed by fire yesterday. The loss is estimated at \$250,000, including four all-metal planes.

The origin of the fire is unknown. According to company officials, no work of any kind was being done, and all gas and oil had been removed from the building.

Combined efforts of the Dearborn fire department, a company from the Detroit fire department and the Fordson department saved the hangar which houses the airplanes used between Dearborn, Chicago and Cleveland.

The experimental plant was a one-story building about 200 feet long. The roof was of wood and the containing walls of thin strips of steel, binding many window panes. Inside were a number of offices, and machinery used in experimentation and construction work.

Foreign Automotive Men Visit Plants

Delegates to Transport Congress
Study American Methods
in Detroit

NEW YORK, Jan. 18—American automobile factory doors are thrown wide open this week to the foreign delegates who attended the second World Motor Transport Congress during the New York show. The delegates arrived in Detroit today and were received by a committee consisting of Roy D. Chapin, chairman, Hudson Motor Car Co.; Charles D. Hastings, president, Hupp Motor Car Corp.; M. L. Pulcher, president, Federal Motor Truck Co.; W. E. Metzger, vice-president, Federal Motor Truck Co.; A. T. Waterfall, vice-president, Dodge Bros., Inc.

Selling the idea of low-cost automobile transportation is the keynote of this factory tour. It is the belief of most of the leading automobile manufacturers here and in other countries that rapid progress in automotive transportation can best be made by exchange of ideas.

High Costs Combatted

While automobile prices in this country are the lowest that they have ever been, the high cost of shipping, financing, tariffs and taxation are still obstacles in many countries. It is believed that through united action the automobile users, traders and manufacturers throughout the world can materially lower the cost of production and provide larger markets.

Among the visiting delegates are: H. G. Burford, Society of Motor Mfrs. & Traders, Ltd., United Kingdom; Paul Cappel, Deutsche Automobil Haendler Verband, Germany; Henri Jenny, H. Jenny & Co., Switzerland; Otto Kleyer, Alderwerke, Germany; Frank Lancaster, Society of Motor Mfrs. & Traders, United Kingdom; M. Tschudi, H. Jenny & Co., Switzerland; C. E. Wallis, Iliffe & Sons, Ltd., England; Prof. O. C. Wawrzynick, Dresden Technische Hochschule, Germany; Rowland Winn, Motor Traders Assn., United Kingdom; G. A. Woodhead, Jones, Woodhead & Sons, Ltd., United Kingdom; Walter Zipper, automotive distributor, Austria; Emil Zipper, automotive distributor, Austria; W. R. Shephard, Motor Traders Assn., United Kingdom.

Holley Co. Develops New Carburetor for Fords

DETROIT, Jan. 19—High fuel economy for year-around operation, and the practical elimination of crankcase dilution are the two outstanding advantages which are claimed for the new vaporizer system which has been developed for Ford cars and trucks by the Holley Carburetor Co. The new unit replaces the standard Ford carburetor and manifolds, and, with its special connections, is adapted to the existing manual control provisions.

Men of the Industry and What They Are Doing

Keith Leaves Car Field to Become Bank Official

At the annual meeting of the Chicago Trust Co., Dayton Keith, formerly with the Ford Motor Co., was elected a vice-president.

Mr. Keith came to Chicago in 1909, and was associated with the Studebaker Corp. of America. In 1911, he became branch manager of the Ford Motor Co. at Indianapolis, then vice-president and general manager of the Ford Motor Co. Transferred to Chicago as manager of the company in 1912, he continued with it until 1921, when he organized the Wills Sainte Claire Co. of Illinois. He disposed of his interest in this company in 1924.

At different times, he was a director of the Motor Truck Association and vice-president of the Automobile Trade Association. Mr. Keith was at one time permanent chairman of the Executive Club of the Automobile Travel Association and chairman of the ethics committee.

Cappelen is Sales Supervisor

A. S. Cappelen has joined the Gemco Mfg. Co., Milwaukee, as a special traveling sales supervisor. Mr. Cappelen, who formerly was with Burd Gilman, will confine his entire efforts to the sale of the Gemco Proportionate Control Shock Absorbers. He will work with the other Gemco sales representatives in their various territories.

Shepard Made Sales Manager

E. H. Shepard, Chicago, has been appointed sales manager for the Rayfield carburetor division of the Beneke & Kropf Mfg. Co., with headquarters in Detroit. He was recently with the Holley Carburetor Co. of Detroit, and for many years was manager of the Detroit branch of Stromberg Motor Devices Co.

V. Bendix Made President

J. L. Price has resigned as president of the Bendix Brake Co., New York, but remains as vice-president of the Bendix Corp., of which the first-named concern is a subsidiary. Vincent Bendix succeeds Mr. Price as president of the Bendix Brake Co.

Clay Goes to Stutz

H. L. Clay, sales and advertising manager of the Lexington Motor Co., Connersville, Ind., has resigned to go with the Stutz Motor Car Co. of America, Inc.

Beaumont With Lexington Co.

C. H. Beaumont was recently made assistant general manager of the Lexington Motor Car Co.

TIMKEN BEARING CO. ANNOUNCES SHIFTS

Changes in the executive personnel of the Timken Roller Bearing Co., Canton, Ohio, have been announced as follows:

Ernest Wooler to be chief engineer. Mr. Wooler in the past was associated with Rolls-Royce, Ltd., Continental Motors Corp., Chandler Motor Co. and the Cleveland Automobile Co.

J. W. Spray to the position of manager of sales and E. W. Austin to assistant manager of sales, automotive division, directing sales work in eastern territory, while R. W. Ballentine, also made assistant manager of sales, automotive division, will direct sales work in Milwaukee territory.

Peter C. Poss has been made assistant advertising manager.

Ford Promotions

C. B. Ostrander, superintendent of the Charlotte, N. C., plant of the Ford Motor Co., was guest of honor at a banquet, where 150 plant foremen and representatives of the sales and service departments said "good bye." Mr. Ostrander has resigned his position and returned to Detroit, where he has accepted a position with the Ford Motor Co.

T. E. Clark succeeds Mr. Ostrander as superintendent of the plant and H. Brown was named assistant superintendent.

Fairhurst Made Manager

William Fairhurst has been appointed sales manager of the Spicer Manufacturing Corp. He was with Packard Motor Car Co. for five years and later spent six years in charge of branch sales offices for the Taft-Pierce Mfg. Co. He has been with Spicer since June last year.

Spicer general sales offices will remain at South Plainfield, N. J., with a western office in General Motors Building, Detroit.

Taylor With Franklin Co.

A. M. Taylor, formerly advertising manager of the Velie Motors Corp., is now with the H. H. Franklin Mfg. Co., Syracuse, N. Y., in the same capacity. For five years before going with Velie, Mr. Taylor was assistant advertising manager for Franklin.

Charls Elected President

The board of directors of the United Alloy Steel Co., have elected George H. Charls president, and L. G. Pritz, vice-president and general manager. Edward A. Langenbach, chairman of the board and also president, resigned the latter office in favor of Mr. Charls.

Yellow Mfg. Sales Corp. Makes Personnel Changes

P. L. Emerson, vice-president in charge of sales of the Yellow Truck & Coach Mfg. Co., Chicago, has been advanced to the presidency of the newly-incorporated Yellow Mfg. Sales Corp., which serves as the selling agency for all Yellow Truck & Coach products, excepting GMC trucks and is broader in scope than the Yellow Cab Mfg. Sales Corp., which it supplanted.

The new corporation personnel also includes: H. T. Kessler, vice-president in charge of cab and Hertz car sales; H. E. Listman, vice-president in charge of coach sales; I. B. Babcock, secretary and treasurer; W. F. Fielder, asst. secretary, and E. J. Keilty, asst. treasurer.

Spinney Buys Company

B. H. Spinney, for 14 years with the Wetmore Savage Automotive Equipment Co., and for the last few years manager of the automotive department for that company, has purchased the Springfield branch of Wetmore Savage, and will conduct it as the B. H. Spinney Co.

Pierce and Pulcher Speak

About 100 dealers attended a Federal Motor Truck dinner at the Hotel Commodore, New York, last week. F. L. Pierce, vice-president in charge of sales, was toastmaster, and Martin L. Pulcher, president, also spoke.

Carlson on Vacation

George Carlson, of Portland, Ore., formerly with the traffic department of the S. P. & S. Ry. in that city, but now Northern European agent of the Ford Motor Co. at Copenhagen, Denmark, is spending a vacation at his former home.

Harrington to Address S. A. E.

At a meeting of the Milwaukee section of the Society of Automotive Engineers, Feb. 3, Arthur W. Harrington, consulting engineer, will discuss "Our Traffic Problems and the Future."

Schmidt Assists Daniels

L. A. Schmidt, formerly chief engineer at the Fiat plant in Poughkeepsie, has been appointed consulting engineer for the Locomobile Co. of America, Inc., and assistant to G. E. Daniels, vice-president.

Bauer Made Manager

The L. H. Gilmer Co., Philadelphia, announces the appointment of Charles H. Bauer as manager of its automotive jobber sales division, succeeding W. H. Smith, resigned.

Safford a Director

The board of directors of the M. & A. M. A., last week elected Lou A. Safford, of McQuay-Norris Mfg. Co., to the board to fill an unexpired term.

600,000 Chevrolets Planned for 1926

Schedule Also Calls for 50,000 Trucks—Banquet for Dealers

NEW YORK, Jan. 20—About 1200 Chevrolet dealers and guests attended the annual eastern district banquet in Hotel Commodore ballroom last week. D. E. Ralston, Atlantic district manager, explained the zone of influence system under which Chevrolet is now making a thorough study of local needs before appointing new direct dealers. He pointed out that a sales promotion expert is working with each regional manager.

R. H. Grant, vice-president and general sales manager of the Chevrolet Motor Co., toastmaster at the banquet, said that the significant thing about the Chevrolet sales curve in 1925 was that it reached its highest point in August and remained there until December.

Chevrolet in 1926 plans to sell at least 600,000 new cars and 50,000 trucks.

Prominent Officials Attend

Among the officials attending the banquet were W. S. Knudsen, president of Chevrolet; C. E. Dawson, assistant general sales manager; C. F. Barth, vice-president and plant manager; O. E. Hunt, chief engineer; R. K. White, sales promotion manager; John E. Grimm, Jr., advertising manager; J. P. Little, parts and service manager; J. L. Pratt, vice-president of General Motors Corp.; C. F. Kettering, vice-president, General Motors; J. D. Mooney, president, General Motors Export Co.; K. T. Keller, vice-president and general manager, General Motors of Canada, Ltd.; C. C. Cooper, president, General Motors Acceptance Corp.; Pierre S. du Pont, chairman of the board, General Motors Corp.; F. J. Fisher, vice-president, General Motors Corp.; and E. G. Beichler, president, Delco Light Co.

The banquet followed an afternoon business session in Mecca Temple, where addresses were made by Messrs. Grant, White, Grimm, Little, W. G. Lewellyn, editor of The Sales Speedster; Sidney Corbett, manager of the Fleet sales division, and W. H. Blees, manager of the Chevrolet 6 per cent purchase certificate division.

States Consider Motor Fuel Tax Regulations

NEW YORK, Jan. 18—A bill imposing a tax of 1 cent per gallon on gasoline sold, with 10 per cent of this revenue to be retained by the State, has been referred to the Taxation and Retrenchment Committee in the State Assembly at Albany. The Committee on Ways and Means is considering another bill imposing a tax of 1 cent per gallon on motor fuel.

The American Petroleum Institute reports the following bills: Kentucky,

to decrease the gallon tax from 3 to 5 cents; Mississippi, to impose an excise tax on persons engaged in distributing motor oils, to require common carriers to render quarterly reports to the auditor of public accounts, showing the number of gallons of motor oil delivered; South Carolina, to require the State Highway Commission to turn over to the State Treasurer all proceeds from the 3 cents per gallon tax, and to authorize the Treasurer to use these proceeds for general purposes; to provide for a system of hard surface roads by further defining the distribution of gasoline taxes and the fixing of automobile licenses.

Moon Co. Enlarges Plant Facilities

ST. LOUIS, Jan. 19—Moon Motor Car Co. announces an expansion program to take care of the increase in its business and provide better facilities for its development.

A new final test division is housed in a Monitor-type building with a floor space of 65,000 sq. ft. The research division of the engineering department has been enlarged and placed in charge of Carl M. Walter, experimental engineer. The Moon Co. has also acquired a large warehouse at the corner of Douglass and North Second St., which it will use to house its parts division.

Flint Co. to Produce 40,000 Cars in 1926

NEW YORK, Jan. 21—Production of cars for 1926 will be greater than 40,000, announced R. H. Mulch, vice-president of the Flint Motor Co., at the annual banquet held at the Roosevelt last week.

Mr. Mulch was enthusiastic concerning the future prospects of his company and talked at length on new methods of merchandising and improvements which have been incorporated in the Flint products. In addition, he said that the general advertising appropriations would be considerably increased this year.

Other speakers included T. S. Johnston and Bartley Doyle, guest speaker and eastern publisher.

Carburetor Adjustment is California S. A. E. Topic

LOS ANGELES, Jan. 19—How to determine correct carburetor adjustment, and effects of improper adjustment on economy, power, carbon, engine wear and crank case dilution, was the subject of discussion at the recent meeting of the Southern California Section, Society of Automotive Engineers.

The speakers included O. H. Ensign, of the Ensign Carburetor Co.; J. F. Dixon, of the Zenith Carburetor Co.; Tom O. Duggan, of the Los Angeles office of Chanslor & Lyon, and Joe White, of the Schebler Carburetor Co.

Members of the Service Managers Association of Los Angeles attended.

Urge Amendments to Car Theft Law

Trade Bodies Find Act Does Not Cover Vehicles Rented or Loaned

WASHINGTON, Jan. 21—Though the national automobile theft act prohibits the transportation in interstate commerce of stolen automobiles, it has been found that the law does not prohibit transportation of cars which have been loaned or rented in good faith and later stolen by the person to whom they were loaned or rented.

To remedy this situation representatives of the American Drivurself Association and the Hertz Drivurself System, of Chicago, the Saunders System of Kansas City, Mo., the American Automobile Association, and the National Automobile Dealers Association appeared before a subcommittee of the House Judiciary Committee this week to urge an amendment to the present law to remedy the situation.

To Make Convictions Easier

Under the proposed amendment, not only would persons who steal automobiles outright be subjected to Federal prosecution but also those who commit larceny after trust and those who embezzle automobiles would be subject to prosecution.

The proposed change is sponsored by H. C. Bradfield, of Chicago, who started the original agitation for the enactment of this act, better known as the Dyer Bill. The proposed change in the law is understood to have the approval of the Department of Justice and of district attorneys who have tried cases under the national automobile theft act. The amendment will make it much easier to obtain convictions of all classes of persons who transport stolen automobiles in interstate commerce.

Car & Foundry Not to Move Fageol Plant

NEW YORK, Jan. 19—The American Car & Foundry Motors Co., it is announced, does not plan to move the Fageol Motors Co. of Ohio plant from Kent, Ohio, but it is considering the addition of another plant, possibly in Detroit. An additional plant is needed, it is said, to increase output. The present output at the Kent plant is two buses daily.

Bassett and Strong Address Buick Luncheon

NEW YORK, Jan. 21—About 30 branch managers and distributors attended a Buick luncheon at the Hotel Commodore last week. Among the speakers were H. H. Bassett, president and general manager of the Buick Motor Co., and E. T. Strong, general sales manager.

Paige-Detroit Co. to Increase Output

NEW YORK, Jan. 19—Outlining the 1926 production schedule, H. M. Jewett, president of Paige-Detroit Motor Car Co., told 1000 eastern Paige-Jewett dealers at their Hotel Commodore dinner last week that the new Paige output alone would double that of the combined Paige and Jewett production last year.

He said the advertising campaign called for expenditure of \$3,250,000, and that the company had in the past spent more than \$20,000,000 in advancing sales.

Balloon Tires Gain in Favor on Cars and Buses

AKRON, OHIO, Jan. 19—Tire manufacturers here report that with the beginning of the new year practically all automobile makers fit their cars with balloon tires as original equipment. Some manufacturers make balloon tires optional with the purchaser but a great many do not even provide for the sale of cars equipped with high pressure tires, it is claimed.

The bus and truck tire departments of the big rubber factories are growing steadily in response to the nation-wide development of highway transportation

in connection with both freight and passenger car business. A big increase in the number of buses and trucks in operation was seen in the last year, while a similar development is forecast in 1926.

Chandler-Cleveland Officers Optimistic

NEW YORK, Jan. 19—Chandler and Cleveland dealers at a dinner at Hotel Astor last week heard optimistic estimates of 1926 business as given by George M. Graham, vice-president and sales director of the Chandler Motor Car Co. About 450 dealers, distributors and salesmen attended.

Among the officials present were F. C. Chandler, president of Chandler Motor Car Co.; Samuel Regar, treasurer; J. V. Whitbeck, Cleveland president; Sid Black, vice-president in charge of sales; J. B. Hulett, New York distributor, and Frank E. Connor, Chicago sales manager.

Schutte Plans Expansion

NEW YORK, Jan. 20—The Charles Schutte Body Co., which now occupies a two-story building with about 6,000 sq. ft. of floor space at Lancaster, Pa., is preparing to expand its facilities soon to care for increasing business, according to Charles E. Schutte, president.

Buick First Quarter Output to be 74,360

DETROIT, Jan. 21—It was announced that the Buick Motor Co. was planning to produce 74,360 cars in the first quarter of 1926, exceeding all previous records for that period.

In 1925, the company produced 192,000 automobiles, of which 110,000 were built after July, 1925, when the new models were brought out. Production in the early part of 1925 averaged 18,500 cars monthly, while, in the first quarter of 1926, the schedule calls for 24,783 cars a month.

Waterloo Engine Co. at Work After Remodeling

WATERLOO, IOWA, Jan. 20—The Waterloo Gasoline Engine Co., which was purchased by John Deere & Co., Moline, Ill., in 1918, has been remodeled in the last two years and is running steadily with a full complement of nearly 1,000 men.

The company has developed and perfected a new line of tractors and small engines which has required much new machinery to replace old machinery made obsolete by changes in designs.

Allen H. Head is secretary and manager of the Waterloo Gas Engine Co., branch of John Deere & Co.

Developments of the Week in Leading Motor Stocks

NEW YORK, Jan. 21—The stock market this week has had to face the anomaly of an easier credit situation, and the fear that bankers were about to apply brakes to the speculation in stocks. The Clearing House institutions last week made good the deficit in reserves of the previous week and showed a comfortable reserve position. This had been obtained, however, through exercise of the Federal Reserve facilities, and when the local Federal Reserve Bank called upon its members for a detailed statement of their loans with stocks and bonds as collateral security, the speculative element professed to see impending discrimination against such loans and hastened to dispose of its holdings. The result was a drastic decline, which, however, did not affect the stocks of the motor companies to the same degree as other issues.

In the case of the stocks identified with the automobile industry, the decline of the previous week had strengthened the technical position through the elimination of weakly-held stocks and the creation of a short interest. While the stocks of this group declined along with the rest of the market, there was a much better demand for them at the lower levels, established a week ago, than for many of the so-called standard issues.

Sentiment in Wall Street is almost universally bearish not alone because of the high level at which stocks are selling

and the manifest absence of the speculative public from the market, but because it is convinced that while manufacturing activity, and consequent production and consumption, will be on a large scale during the first quarter of the year, it believes that profits during this period will be small, due to the highly competitive conditions which are obtaining, and it believes, further, that this will mark the peak of the present era of prosperity.

Industrial Stabilization Sought

It should be borne in mind that ever since 1921 the efforts of Government officials and of leaders of finance and industry have been directed toward stabilization. At various times during these five years we have seen an economic condition which seemed to presage a period of business depression, but on each of these occasions an artificial stimulus was provided. In the final analysis, the question to be determined is whether or not a sufficient demand exists, or can be created, to consume the increased productive capacity of our industries. This may lie abroad.

The copper industry has demonstrated the dependence of the domestic producers of metal upon foreign markets. Our cotton planters, and, in only less degree, our wheat growers, have learned that they, too, are dependent upon Europe. It is becoming evident that our industrial enterprises are, in many cases, similarly bound up in the progress of foreign af-

fairs and the development of foreign markets.

European buying-power has been largely curtailed since the Stinnes failures in Germany last summer and the politico-financial crises in France. These are temporary, although generally disturbing, but it may well be that individual initiative will provide the credit necessary to develop these markets regardless of political exigencies. If, either through artificial stimulation of credit in this country or the providing of private credits abroad, markets can be provided for our surplus products, there is no reason to believe that the present era of prosperity cannot continue.

Under the conditions prevailing in the securities market, where the ebb and flow of prices result largely from the whim of professional speculators, comment upon individual stocks, unaccompanied by any specific news developments, is idle. It is apparent that liquidation by other-enthusiastic buyers of last fall is in progress and such liquidating movements have to run their course. It should not be forgotten, however, that a liquidating market in January is by no means unusual, nor is it to be accepted, without reserve, as an indication of business for the rest of the year. There are many enthusiastic sellers of stocks today who will be as ardently buying when the seasonal "spring rise" makes its appearance.—H. H. S.

British Tire Exports Show Healthy Growth

Valued at £7,701,341—Third Place in World Market Shared With Canada

WASHINGTON, Jan. 20—Exports of rubber tires of all types from Great Britain in 1924 showed a steady increase, according to official statistics of the Department of Commerce, just made public here, which assigns them a value of £7,701,341.

Figures of British motor car casing exports give increases from 270,721 in 1922, to 397,130 in 1923, and to 550,245 in 1924. Using the 1922 figures as 100 per cent the 1923 volume was 146.7 per cent, while 1924 was 203.3 per cent. For the same period, the casings exported from the United States showed a static, or slightly declining, tendency.

Solid Tires' Figures

The British exports of solid auto tires also showed an increase, from a figure of 54,812 tires in 1922, to 59,278 in 1923, to 96,847 in 1923 and to 102,782 in 1924. Value figures showed the same general tendency in each country.

In the world tire market the relative positions were maintained in 1924, with France the leader, the United States second, and Great Britain and Canada continuing in close competition for third place.

Denies British Government Fixes Rubber Prices

NEW YORK, Jan. 18—As he sailed for England, Sir William Letts, K. B. E., president of the Society of Motor Manufacturers and Traders of Great Britain, and managing director of Willys-Overland Crossley, Ltd., Manchester, who attended the World Motor Transport Congress here last week, issued a statement declaring that no one could say that the British Government was fixing the price of rubber, and that present crude prices had been caused by speculation both by insiders and outsiders. He expressed the belief that phenomenal demand for automobiles in the United States made it rather surprising to talk about these prices affecting users.

Concluding, Sir William said British automotive men were just as anxious as Americans for tire prices to be put at an economic figure.

Car Exports to Mexico About 18,000 in 1925

LAREDO, TEX., Jan. 21—Approximately 18,000 motor vehicles of American manufacture were exports to Mexico in 1925, according to incomplete figures that have been compiled by customs brokers. The shipments through Laredo were approximately 9,000, nearly all of which were passenger cars. These motor

vehicles filled 1,366 cars, compared with a total of 737 cars in 1924.

Exports through Tampico, El Paso, Eagle Pass and Brownsville were considerably larger than last year, but the exact figures are not yet available.

Harrison Corp. Puts Out New Radiator

NEW YORK, Jan. 19—A complete line of replacement radiators designed to provide any make of car having pump circulation with evaporative or steam cooling, has been brought out by the Harrison Radiator Corp. The new radiators will be marketed under the name "Iso Therm" through United Motors Service, Inc.

To make the conversion to evaporative cooling, it is necessary only to substitute an Iso-Therm core which differs from the conventional type mainly in that the passages are horizontal instead of vertical. Steam enters the radiator near the top and at the side, and, in passing horizontally to the other side, is condensed. The water thus formed is pumped back into the jackets in the ordinary manner. Externally, installation of the new type radiator does not alter the appearance of the car.

The name Iso-Therm means that, with evaporative cooling, the engine operates at a constant jacket temperature. If it is so desired, a car equipped with the new radiator may be operated as a water-cooled job.

Among the advantages claimed for evaporative cooling are simplicity, increased gasoline mileage, easier starting and better lubrication.

Front Brakes Barred on London Public Vehicles

LONDON, Jan. 7 (by mail)—The Commissioner of the Metropolitan Police has announced the present time is not opportune for the introduction of front wheel brakes on motor buses and taxicabs, due to the inability of existing vehicles to withstand the additional stresses imposed by the fitting and use of front brakes; to the fact that incorrect adjustments would be a source of danger, and to the fact that whenever a bus has overturned, it has nearly always been traced to a combination of full steering lock and powerful braking. It is considered that a more effective brake equipment would aggravate this risk, especially as it would be conducive to higher speeds.

In regard to taxicabs, it is felt that it would encourage higher speeds by affording a capacity for decelerating more rapidly.

Ford's Green Island Plant to be Enlarged

COHOES, N. Y., Jan. 21—To increase production this year, two new departments will soon be added to the Ford Motor Co.'s plant at Green Island, it is announced.

U. S. Rubber Adds to Plantation Areas

5700 Acres of Sumatra Lands Added—Negotiates for 12,500 Acres More

NEW YORK, Jan. 21—C. B. Seger, president, announces that the United States Rubber Co. has added 5700 acres to its rubber-growing lands in Sumatra, Dutch East Indies, and is negotiating for 12,500 acres more.

Excluding the area still under negotiation, the company has 124,014 acres of rubber plantation lands, representing an investment of about \$25,000,000. About 59 per cent of these lands is planted with more than 7,000,000 rubber trees. The company has 29,691 acres in Malaya.

Mr. Seger said that substantially all the rubber received by the company from its own plantations comes to the United States in the form of sprayed rubber, a patented product, and the company also imports large quantities of rubber in the form of latex.

In 1925 the company's plantations yielded approximately 20,000,000 pounds of rubber. Mr. Seger estimates that by June this production will have increased 75 per cent.

European Grand Prix to be Held in Spain July 25

PARIS, FRANCE, Jan. 7 (by mail)—This year the race for the Grand Prix de l'Europe will be held in Spain, over the Lasarte course, at the gates of San Sebastian, the famous resort on the Bay of Biscay, which is the summer residence of the Spanish royal family. All arrangements have been entrusted to the local club, the Automobile Club of Guipuzcoa.

In addition to the race for the European Grand Prix, which will be open to racing cars of 91.5 cu. in. displacement, and will be run on July 25 over a distance of 500 miles, approximately, there will be a race for the Grand Prix of Spain on July 18, over a distance of 437 miles, which will be open to cars of a minimum weight of 1430 lbs., and the touring Grand Prix over a distance of 625 miles, for touring cars of all classes. The total prizes offered in connection with these races are said to amount to \$50,000.

Philippine Rubber Growth Favored by Haussermann

NEW YORK, Jan. 21—Judge John W. Haussermann, vice-president of the American Chamber of Commerce of the Philippine Islands, advocates American cultivation of rubber in the Philippines. The Jones Act restricts to 2500 acres the land which can be held by individual corporations in the Philippines. This would interfere with rubber cultivation on a large scale by American companies, but Judge Haussermann believes that Congress would remove this restriction.

Coming Events

SHOWS

Jan. 18-23—New York, Twelfth National Motorcycle, Bicycle and Accessory Show, New Madison Square Garden.

Jan. 22-30—National Motor Boat Show, Grand Central Palace, New York.

Jan. 30-Feb. 6—Chicago N.A. C.C. National Annual Show, Coliseum.

Jan. 30-Feb. 6—Chicago, Automobile Salon, Hotel Drake.

Feb. 13-Mar. 15—International Automobile Show, Copenhagen, Denmark.

CONVENTIONS

Jan. 21-22—Hotel Statler, Buffalo, N. Y., Winter Sectional Meeting, American Society for Steel Treating.

Feb. 1-3—Chicago, Ninth Annual National Automobile Dealers Association, La Salle Hotel.

Feb. 2-3—Congress Hotel, Chicago, Automotive Electric Service Association.

S.A.E. MEETINGS

National

Jan. 26-29—Detroit, Annual Meeting.

Report Shows Loss on Imperial Airways

Despite Government Subsidy, Deficit of £15,217 is Reported

LONDON, Jan. 7 (by mail)—The first report of Imperial Airways, Ltd., the British air transport company formed in 1924, under agreement with the Air Ministry, to take over the four companies then operating, has been issued for the year ended March 31, 1925, and shows, a loss of £15,217 after receiving £139,409 in state subsidy. This result is apparent after providing for an "obsolescence reserve" of £22,998, ordinary depreciation and maintenance amounting to £63,553.

An important section of the report refers to the basis of the Government subsidy to the company; it has not been found to further the intentions and aims of the Government, nor does it give the company the amount of assistance originally contemplated. It is stated that a modification of the agreement between the company and the Government has been negotiated. The new form of subsidy, instead of being based upon a certain minimum mileage per annum (800,000 to begin with), has been altered to one taking into account a minimum number of horsepower-miles per annum, viz., 425,000,000. The effect, it is said, will be far-reaching. With a subsidy on a mileage basis, a small and, therefore, relatively uneconomical machine could obtain as much subsidy as a twin-engined machine carrying more than 20 passengers; hence, it gave no encouragement to the company to sink capital in developing the larger type, although the latter, obviously, must carry a larger proportion of paying load to running costs.

Imperial Airways, Ltd., Plans New Line to India

LONDON, Jan. 7 (by mail)—At the first annual meeting of Imperial Airways, Ltd., Sir Eric Geddes, chairman of the company, stated that, besides the variation made by the government in the terms of the general subsidy, resulting in the basis being horsepower-miles instead of mileage alone, a new agreement had been made with the govern-

Coming Feature Issues of Chilton Class Journal Publications

Feb. 4—Motor Age—Chicago Show Number.

Feb. 4—Motor World Wholesale—Chicago Show Report.

Feb. 18—Automotive Industries—Statistical Issue.

ment which would result in an air line being inaugurated between Egypt and India on Jan. 1, 1927, subject to an annual subsidy of £93,600 for five years, the government to provide aerodromes, hangars and other accommodations.

Subsequent to the meeting it was made known that an order has been placed with the De Havilland Aircraft Co. for five large passenger aircraft for use over the new route. Three-engined planes have been specified, and the fuselage will be all-metal, only the wings being constructed of wood. Radial air-cooled engines, each of about 385 hp. will be installed, and a cabin able to accommodate 14 passengers is called for.

The first machine will be delivered in October, and the subsequent machines at fortnightly intervals. This is the first time the De Havilland firm has built a three-engined machine, though it has constructed twin-engined aircraft.

Spain to Nationalize Automotive Manufacture

WASHINGTON, Jan. 19—The Spanish Government has declared its purpose of nationalizing the automotive manufacture and body-building industry, and has invited suggestions from Spanish manufacturers as to the best means of doing so, it is announced here by the Bureau of Foreign and Domestic Commerce.

Correction

It was stated in these columns in a recent issue that the C. G. Spring & Bumper Co.'s daylight production capacity would shortly be increased to 100,000 daily. The figure should have been 200,000 monthly.

Automobile Industry Gains in Britain

Eleven Months' Imports Triple Those in 1924—British Production Larger

WASHINGTON, Jan. 19—There is continued improvement in the automobile industry in the United Kingdom, with British production and export of passenger cars, trucks and motorcycles considerably larger than in 1924, the automotive division of the Department of Commerce is informed.

Eleven months imports in 1925 of passenger cars numbered 32,163, nearly three times the total for the same period in 1924. There were 612 trucks imported, as compared with 1,307 in the preceding year. Chassis numbered 14,264 as compared with 11,338; imports of motorcycles were 870, as compared with 461. Sales of new cars, of which 75 per cent were light vehicles, were estimated to exceed 100,000.

Some American medium-priced cars sold exceptionally well and an increase occurred in the case of at least one high-priced American make. The outlook for American cars is encouraging.

Sound Financing Urged at Rickenbacker Lunch

NEW YORK, Jan. 21—About 200 dealers attended the Rickenbacker luncheon at the Hotel Commodore last week.

W. E. Knox, discussing the relation of the banker to the automotive industry, urged the necessity of the soundest possible financial practices in factory operation and retail sales. Financing was also discussed by A. G. Boezel, a recently elected Rickenbacker director and an executive in Noyes & Jackson. Both speakers regarded the future optimistically, basing their predictions especially on general conditions and public utility corporation prosperity.

Captain E. V. Rickenbacker and R. T. Hodgkin, general sales manager, also spoke. The desirability of adding the new Rickenbacker super-sport car to the dealer line was emphasized.

Those at the head table included F. R. Bump, in charge of eastern territory, and E. Le Roy Pelletier, in charge of advertising.